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## Original Articles

### TUBERCULOSIS IN CHILDREN.\*

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In this paper an attempt will be made to discuss the question of what shall constitute sufficient evidence to warrant the diagnosis of tuberculous infection in children. Preliminary to this three closely allied subjects will be considered; (1) The wide spread prevalence of this disease as proved at autopsy; (2) The significance of the tuberculin reaction; (3) The relation of clinical tuberculosis in the adult to infection during childhood.

Medin, at the Stockholm Hospital, reports autopsies on 7,630 children who died during the first year. Six hundred and twenty-three or 8½ per cent. had definite tuberculous lesions. Hamburger in Vienna, in 401 autopsies on children under fourteen found tuberculous lesions in 160 or 40 per cent. Under one, 16 per cent. showed lesions. From one to two, 42 per cent.; from two to four, 59 per cent.; from five to six, 60 per cent.; from seven to ten, 64 per cent.; from eleven to fourteen, 77 per cent. Schmorl in Dresden shows similar figures as to the actual demonstration of lesions at autopsy. Naegeli at Zurich reports 97 per cent. of cases in 500 autopsies of children under fifteen.

These figures are from actual autopsy findings in children dying from all causes and show that tuberculous infection is present in a demonstrable degree in a very large number of children by the time they are fifteen years of age.

There has been a great diversity of opinion among the medical men as to diagnostic importance of the tuberculin reaction. Early users of tuberculin for diagnostic purposes soon discovered that individuals who were apparently healthy reacted to tuberculin. These observa-

tions led to a distrust of the specific nature of the reaction. The use of tuberculin to determine the presence of tuberculosis among cattle soon established the fact that the reaction is specific. Autopsy findings corroborated the reactions. However, it was discovered that many reacting cattle were not sick and if not killed, showed no evidence of disease. The deduction from this is that a tuberculin reaction indicates infection but not necessarily an active disease.

Another observation which further established the specific nature of the reaction is that the percentage of patients reacting to tuberculin bears a definite relation to the ages of the patients. The percentage reacting at the various ages corresponds very closely to the autopsy findings. The older the patient the greater is the likelihood of infection and the more probability of a reaction. New born infants do not react to even enormous doses of tuberculin. Schreiber made observation on forty new born infants and never produced a reaction even with 50 mg. of tuberculin. The new-born infant does not react because he has no infection. Most adults will react to a sufficiently large dose and most adults will have at autopsy anatomical evidence of infection. The younger the child the more value we may place on tuberculin reaction as evidence of recent and active lesion. A Brown says that in his hospital practice 90 per cent. of children under two who show a positive Von Pirquet have active and fatal tuberculosis.

On account of the evident fact of rather general infection during childhood students of tuberculosis have come to associate many cases of clinical tuberculosis in adults with this childhood infection. Hamburger says that tuberculosis may be compared to syphilis and describes a primary, secondary and tertiary stage, childhood usually being the time when primary infection occurs. Baldwin in his recent article on "Allergy and Reinfection in Tuberculosis" reviews the work of Von Pirquet, Roemer, Hamburger and others and concludes "that childhood

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is the time of infection and youth the time of super-infection and that from extension of the primary disease." Pottenger says that "The usual clinical history of patients suffering from tuberculosis when carefully analyzed leaves little doubt that the disease as it presents itself is either a new activity in or an extension from an old focus." There is no doubt that infection during childhood is very general. Theoretical considerations make it seem very probable that these infections persisting are a common cause of adult tuberculosis.

Any cause which lessens the acquired immunity to the organism may result in an awakening of the old infection and the development of an active lesion. Acute infections, exposure, hard work, faulty nourishment, improper sanitary conditions and alcoholism may be mentioned among the factors which have much to do with the lowering of resistance to the disease. The tubercle bacillus is present and only awaits favorable conditions for becoming active and producing serious lesions.

The detection of these early infections and the attempt to do all that is possible in assisting nature to adequately heal them is especially important in view of this theory concerning the cause of tuberculosis in adults. Children with a cough, anemic children, poorly nourished children, those who have frequent fevers, children with enlarged glands or obscure bone and joint pains, in fact all children who fall below the normal standards of physical vigor and continue to do so, should be carefully examined for evidences of tuberculosis.

History of family tuberculosis or tuberculosis in the household is of great value. The younger the child the more easily the source of infection may be found. In infants the infection can usually be traced directly to another case. As the child becomes older and gets about on the floor, the sources of possible infection becomes more numerous and consequently the actual source is less easily determined. Children who are not doing well and who give a history of exposure should be strongly suspected of tuberculosis.

Frequent observations of pulse and temperature should be made in suspected cases. Frequent elevations of temperature and rapid pulse are often evidences of a tuberculous focus. Unless other definite causes for a chronic toxemia can be demonstrated, tuberculosis is the most probable cause. Single office observations of pulse and temperature are of little value.

Physical examination must of course be given

the first place in determining tuberculosis in children. Such examinations should be made with a full appreciation of the different anatomical locations that are possible, glands, both deep and superficial, bones, joints, lungs, pleura, peritoneum, genito urinary organs, meninges and other parts of the body. If such an examination is made lesions can be demonstrated in the great majority of these children in whom we have other reasons for suspecting tuberculosis.

The Von Pirquet reaction must be given much consideration in childhood. Until two or three years of age a prompt reaction to tuberculin must be well nigh conclusive evidence of active tuberculosis. In older children reactions that are prompt and marked must be recognized as of great importance in diagnosing these cases. They indicate tuberculous infection and in a child who is not doing well and in whom no other definite disease can be located, tuberculosis is the most probable cause of the debility.

The X-ray is of great value in the diagnosis of tuberculosis of the chest, bones and joints. In children who do not give history of pneumonia or empyema, tuberculosis is the most common cause of deposits in the lungs.

Demonstration of bacilli is of course the most certain sign of tuberculosis. This is a sign that is not frequently found in children. If one makes this the *sine qua non* of diagnosis in children few early diagnoses will be made.

A child who is not doing well, who gives a history of exposure to tuberculosis, who has frequent elevations of temperature, who has demonstrable physical signs, who gives a positive Von Pirquet, who has X-ray evidences of the disease and in whom tubercle-bacilli may be demonstrated may be safely said to have tuberculosis in a clinical sense. How many of these signs may be eliminated and still allow us to be fairly sure of our diagnosis? The demonstration of the bacilli we may safely leave out of this evidence. Extensive disease of the lungs, pleura, bones, joints, glands, or genito-urinary tract may permit the demonstration of the bacilli, but we must certainly not wait for this. X-ray evidence while of great value should not be waited for in making a diagnosis. Considerable tissue change must take place before the X-ray will show the abnormal shadows. While a definite history of exposure as from a tuberculous father or mother may be of very positive value in deciding a given case surely the absence of such history must have a very negative value. In the great majority of cases

of tuberculosis after the second year, the source of infection is not apparent. Certainly the possibilities of a child coming in contact with tubercle bacilli are many.

The question has been raised as to whether we may make a diagnosis of tuberculosis before the appearance of definite physical signs. Is it permissible to make such a diagnosis in anemic, poorly nourished children who have elevation of temperature and who give a positive Von Pirquet? Such cases are frequently called pre-tubercular or are said to be threatened with tuberculosis. It would seem that these cases are usually cases of infection with tubercle bacillus and should be treated as such. Such cases show remarkable gain when put under favorable conditions. A great many such cases have been found in our Kalamazoo Dispensary and placed in the Open Air School. Their improvement has been gratifying in the great majority of cases.

The greatest single consideration in the study of tuberculosis in childhood is that of immunity. If children become immunized by accidental infection beyond our control, why should not immunity be obtained by controllable means? Vaccination holds out the greatest hope for the future. The laboratory must determine the safest procedure. In conclusion I wish to quote again from Pottenger. He says "Personally, I believe that the prevention of tuberculosis will come through vaccination and, if I interpret the work of our leaders rightly, such a desideratum is not as far off as many believe. The experimental studies of immunity made by such men as Koch, Behring, Maragliano, Wright, Roemer, Wolf-Eisner, Calmette, Spengler, Trudeau, Von Ruck and others and the very interesting reports by the use of the living bacillus made by Webb are blazing the way for one of the greatest boons to the human race, the production of a positive immunity."

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#### MILIARY TUBERCULOSIS OF THE LUNGS IN THE SENILE PERIOD.\*

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In view of the quite general campaign which is being waged so vigorously against tuberculosis it has seemed expedient to me to call attention to a source of danger which is not generally recognized, that of miliary tuberculosis of the

lungs in the senile period. So little mention has been made of the subject by text book and magazine writers that when I first began to find in my post mortem work a diffuse miliary condition in the aged I regarded the cases as rare, but as time went on and the number increased it occurred to me the condition was much more common than was generally suspected and therefore a great source of danger from its lack of recognition and from the housing up and close contact with other members of the family which the age of the patients would necessitate. The very high percentage of deaths from tuberculosis during early life leads us to think of it as a disease of young adults. It has been estimated that nearly one-third of those who die from it are between 15 and 40 years of age and that the total deaths between 40 and 60 years of age are only one-half what they are between 15 and 40; yet when estimated on the basis of 1,000 living at those two decades we obtain practically the same percentages and upon the same basis it is twice as high for those of 65 as for those under 20 years of age. Of the very few writers who have given any definite statistics as to the frequency in the senile age Barré of Paris found 2.29 per cent. of cases 60 years old or more in 92.141 deaths from phthisis in ten large hospitals during the years 1884-1893 and Hawes in a recent paper on the subject found 1.08 per cent. among 6,832 consumptives in the four Massachusetts State Sanatoria during the last four years. The disparity between the two sets of figures is accounted for in the difference in the basis for calculation. That the percentages of Barré and Hawes do not give us even an approximate idea of the frequency of the condition in the aged is evident from the fact that it is so rarely recognized that a minimum number of those really suffering would be given the care of sanatoria, or among those sent to the general hospitals a complicating cause would probably gain admission and only at autopsy would the lung trouble be recognized.

Pulmonary tuberculosis in the elderly is diagnosed less frequently than at any other period on account of its chronicity, the absence of symptoms usually accompanying it, the rather common presence of chronic bronchitis, emphysema or cardiac coughs which it is so often mistaken for. Stoll in 1912 in reporting seventy-four cases over 60 years of age lays emphasis upon the chronicity of the disease, citing cases which had become infected thirty-two and thirty-eight years previously, or possibly even in childhood, extending over long years with pe-

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riods of arrest when the symptoms were more or less in abeyance, and which had been diagnosed grippe, malaria, chronic coughs, asthma, etc., but which upon careful examination presented the physical signs of lung tuberculosis, being confirmed at autopsy. Hawes also believed the condition was a continuing or awakening of an old tuberculous focus and therefore a chronic one. Barré and Hart while recognizing the possibility of its resulting from the awakening of hitherto quiescent lesions laid great stress upon its being a sequel of chronic bronchitis or bronchiectasis. Mascher believed it to be rarely a primary infection but the result of a previous inflammatory condition. That it should escape diagnosis from a difference in the clinical picture at an earlier period in life is only too evident since fever is rare, night sweats are usually absent, constitutional disturbances are slight, physical signs are often masked by emphysema or asthma, loss of weight and weakness are of little clinical value for they belong to the period we are discussing, cough and shortness of breath are the most prominent symptoms and these are attributed usually to chronic bronchitis and emphysema, rarely is the sputum examined for it is usually accounted for by the chronic cough.

My present work is based on the autopsy material and the clinical cases giving positive physical signs during the last two and one-half years in the Kalamazoo State Hospital for the Insane. While it is true that the defective functions and nutrition of those suffering with the true psychoses predispose them to tubercular infection 30.7 per cent. of the seniles giving positive lung findings at autopsy suffered from psychoses not considered especially predisposing to infection. Institutional care has also been considered an important factor in the past but our modern institutions with their facilities for fresh air and for the detection and prompt isolation of infected cases have reduced the institutional life as an etiologic factor to a minimum. Of my positive autopsy cases 30.7 per cent. had an average residence of one year and two months, or 53.8 per cent. had an average residence of three years and one month; in view of the long course that Stolle, Barré and Hart give to the disease with its early source of infection the hospital residence in these should have had little bearing on their condition, except possibly to aggravate it, as they probably entered the institution with active foci or at least quiescent ones.

Considering 60 years as the beginning senile period there were among the autopsy material

seventy-nine cases over 60 years of age; of these thirteen or 16.4 per cent. of the seniles showed a more or less diffuse miliary condition of the lungs; seven of the thirteen also showed a generalized condition as seen in the involvement of the mesenteric glands, liver, kidneys, etc. The thirteen cases ranged in age as follows: From 60 to 64, one case; 65 to 69, four cases; 70 to 74, five cases; one case 76; one 81 and one 83. Clinically five of the thirteen cases gave physical signs of a tubercular involvement, two were diagnosed emphysema, one chronic bronchitis and five gave negative chest findings. Four of the thirteen had positive sputa, no records of an examination were obtained in the remaining nine cases. One case ran a slight temperature which reached 104 before death, due to a tubercular pneumonia; one ran an occasional temperature which did not go above 100 degrees, eleven gave no histories of temperature. Five cases had negative family histories of tuberculosis, no information was obtained in eight cases. At autopsy three cases showed a diffuse involvement of the left upper lobe, two of the right upper lobe, three of both right and left upper lobes, one of the right lower lobe with a tubercular involvement of both submaxillary glands, three a diffuse involvement of both right and left lungs and one tubercular ulcer of the larynx. This last case does not properly belong among the group but as a source of infection from the respiratory tract I have included her since it is the danger of these patients to others that has compelled me to collect together the facts in regard to them. She also had a tuberculous condition of the peribronchial and mesenteric glands and the kidneys; that there was no extension into the lungs was probably due to a more or less acute condition since in protracted cases of laryngeal tuberculosis the lungs never escape. Macroscopically the lung tissues of twelve cases showed numerous tubercles and caseous masses ranging in size from a few millimeters to several centimeters, scattered between which were pustular or clean cut cavities. There were also seen small dense nodules of scar tissue devoid of giant cells or bacilli and occasionally areas were found surrounded by fibroid capsules, containing caseous and rarely partly calcareous material in which it was possible to demonstrate viable bacilli. In three cases only were there signs of an inflammatory reaction in the tissues surrounding the lesions, in two moderate in degree, in the other rather marked. This lack of reaction could be largely accounted for by the fibrous character of the senile tissues, to

which was also most probably due the chronicity of the process; whatever grew, grew slowly in such poor soil. From the pathology of the lungs we can readily understand the absence of constitutional symptoms. In ten cases there was no enlargement of the bronchial glands, in two there was moderate enlargement, in one, the laryngeal case, considerable enlargement. Among the clinical cases in the house during the past two and one-half years thirty-two were over 60 years of age, making a percentage of 28.5 of all cases showing a lung tuberculosis. These figures cannot be compared with those of Barré or Hawes as theirs included cases under 20 years of age which considerably reduced their percentages; none of mine were under 20, but my findings make prominent the fact that a startlingly large number of seniles show an acute lung condition. Moreover in institutions such as my cases are taken from a larger number of seniles are collected together than are usually found in a general hospital or even in a sanatorium, for the mentally normal can be cared for at home, hence statistics based on seniles alone would give a truer percentage in state institutions than in the above hospitals. What bearing the length of residence in the institution may have had on the infection in the clinical cases may be judged from the fact that one case has been in the hospital only two months, another five months and still another six months and 50 per cent. of the total number two years and six months, rendering rather doubtful the hospital as a source of infection. The thirty-two cases range in age as follows: 60-64, eleven cases; 65-69, eight cases; 70-74, four cases, 75-79, five cases; 80-84, four cases. Among these not more than five or six have shown temperatures, of rather low range and not constant. The appetites have been remarkably good for the age of the patients. Nineteen give positive chest findings, five show only a few rales and eight nothing but coughs aside from the positive sputa. A family history of tuberculosis has been obtained in two cases, negative in eight and unknown in twenty-two. Twenty-five cases give positive sputa, two show no tubercle bacilli upon two examinations each, and in five cases diagnosis had been made upon the chest findings alone, the sputa not having been examined.

This leads us directly to the danger of contact with these patients. Hart held the disease was chronic in course with a tendency to healing by the formation of fibrous tissue and with only a slight tendency to dissemination, the organisms showing an apparent reduced vir-

ulence. Squires takes an opposite view considering the disease slowly progressive and the sputa a constant course of danger. My own experience has been that the sputa, as a rule, contained numerous tubercle bacilli staining with their characteristic activity and not the attenuated or involutional forms; moreover the lesions found at autopsy in the twelve cases were progressive in appearance, healed lesions, quiescent lesions and active foci being seen; films from the purulent cavities showing unusual numbers of bacilli; the entire pathology indicating a slowly progressive process extending over years. When we realize the carelessness of the aged in expectorating and in the lack of cleanliness of their hands they must necessarily be a source of great danger, especially in the families of the poor where they are housed up and usually the caretakers of the children. Stoll cites a case which contracted the disease from her father 65 years of age and she probably infected her daughter who died with tuberculosis. Another patient of his over 60 years of age had been diagnosed chronic malaria but at autopsy showed a tubercular infiltration of both apices and of the parietal pleura; the son and daughter-in-law with whom the patient lived both had active pulmonary lesions, and from the chronicity of the symptoms in the father and the more acute course in the children Stoll concluded the former had most probably infected the latter. I have personally known of three healthy young adults who had the care of a large ward for old people, many of whom had chronic coughs and two a frank tubercular process, who developed an acute lung tuberculosis. It seems to me too much emphasis cannot be laid upon its contagiousness, especially during the periods of acute flare ups which are seen in the chronic course.

The diagnosis is especially difficult since chronic bronchitis, asthma or emphysema so often mask the lesions. The X-ray is of value but to those living in small towns and to the poor it is not available. Stoll lays considerable stress on d'Espines' sign, especially when the whispered bronchophony is heard down to or below the level of the fifth dorsal vertebrae, he considers it questionable in adults when it is heard only over the upper three or four dorsal spines. On the other hand Hawes considered it of little value holding that we could hardly expect much glandular enlargement from the nature of the process. My autopsy work confirms Hawes' view. In ten cases there was no glandular enlargement and the sign

would have given negative results, though the lungs were markedly involved; in two cases the glandular involvement was so moderate it is doubtful if a whispering bronchophony would have been obtained. Stoll also considers a cough severe enough to cause gagging of importance in diagnosing; in 169 cases he found that cough followed by gagging occurred twice as often with tuberculosis as with all other diseases combined, pertusis excepted; finding it especially common in patients presenting signs of bronchial gland enlargement. Examination of the sputa seems to be the most reliable means of diagnosis and should be more generally practiced in those suffering with a cough extending over years or in those subject to chronic bronchitis or asthma; moreover in all families in which there are young tuberculous subjects the elderly members with coughs should have sputa examinations.

It is quite generally conceded that treatment of these aged patients necessarily differs from that of the younger and more vigorous adult. In the State Institution all tuberculous patients regardless of age are isolated in open air shacks and given a generous diet consisting largely of milk and raw eggs. Whether it is the return to a dietary more suitable to their age or whether it is the fresh air it is difficult to say but the senile cases seem to thrive, a fairly large percentage gaining in weight, being apparently more comfortable than when housed up in the wards. Several have shown an amelioration of physical symptoms with a disappearance of bacilli from the sputum. Treatment in the home would depend largely upon the mental make-up of the case; many are like children and cannot be sent away from the home on account of the depressing influence of the strange surroundings; moreover it is very doubtful if the high altitude of the sanatorium would be well borne in view of the cardio vascular changes so common at this period of life; to keep the patient warm and free from rheumatic pains and yet give them sufficient fresh air in the damp climate of the average sanatorium would also be a problem. Squires advises a warm dry climate and small doses of iodide of potassium and his treatment might be carried out with those cases whom financially and mentally it would be possible to transport from the home surroundings; otherwise treatment should aim to minimize the danger of the patient to the other members of the family by careful hygienic methods, to keep them as warm as possible with the maximum amount of fresh air, with a return to a dietary more suited to their

age, milk and raw eggs being its chief constituents. Whether permanent cure is possible is rather doubtful. Hart's belief that there is a tendency to healing by the formation of fibrous tissues is not borne out by my autopsy material. It is true that a fairly large number of seniles showing no acute foci had old fibrous or calcareous lesions of both lungs and pleurae and occasional clean cut apical cavities but whether these were healed lesions of the senile or earlier period it is impossible to say from their case histories. The most sensible plan is to consider aged patients always a source of danger for favorable conditions may cause a recrudescence in a quiescent focus with a rapid dissemination of bacilli and danger to those in contact with the patient.

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#### ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY HEMORRHAGE.\*

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One of the most alarming symptoms of pulmonary tuberculosis is hemorrhage, which is frequently a cause of great anxiety to both physician and patient. Although a discharge of blood from the mouth may be due to other causes, such as valvular heart lesions, bleeding from the nose, throat and mouth, and although the laity and many physicians frequently try to explain it as coming from some other source, in the great majority of instances haemoptysis is due to pulmonary tuberculosis and all such cases should be considered tuberculous in nature until they are proven to be otherwise.

According to Lawrason Brown, 90 per cent. of all cases of haemoptysis are shown sooner or later to be tuberculous, and Cornet states that "All in all, one does not err in considering pulmonary hemorrhage to be of a tuberculous

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nature, although hemorrhages do occur in certain other diseases."

Some authorities consider the effect of haemoptysis to be beneficial in the early stages of tuberculosis, if not frequently repeated, and I have known patients to experience a good deal of relief after losing a slight amount of blood and actually date their recovery from that time.

If the hemorrhage is the initial symptom, it is often a most fortunate thing in that without it the case might remain undiagnosed until an advanced stage was reached.

The source of the hemorrhage can often be determined by the appearance of the blood. If from the gums, it is slight in amount, is coagulated and may be diluted with saliva. If from the nose or throat it may be mixed with mucus. If from a pulmonary vein the blood will be bright red and more or less frothy; but if from a branch of the pulmonary artery, in which case a cavity is usually present, the blood will be dark in color, frothy and more or less coagulated.

A profuse hemorrhage seldom occurs when no cavity is present, although I recently saw a case wherein there were three hemorrhages, with a loss of over a pint of blood within two and a half days, in which neither physical signs nor the X-ray could demonstrate a cavity. Babcock states that blood from a source above the lungs is not accompanied by cough, while pulmonary hemorrhage is invariably accompanied by more or less cough. The amount of cough, however, may be quite slight.

While the *immediate* death rate from pulmonary hemorrhage is low, the indirect mortality is exceedingly high. They are occasionally a cause of sudden death, but the principal source of danger, apart from the depression of spirits and exhaustion due to the loss of blood, lies in the rapid dissemination of tubercle bacilli into healthy areas.

In case the blood with which the diseased lung, and often the opposite healthy lung, is flooded does not contain tubercle bacilli, the resultant lobar or broncho-pneumonia may not be of a tuberculous nature and the patient may recover. But the writer's experience has been that when after a severe pulmonary hemorrhage a sudden rise of temperature occurs on the second or third day, accompanied by dyspnoea and cyanosis and persisting without remission, with the physical signs of lobar or broncho-pneumonia in fresh areas of the lung, the disease process is found to have been greatly aggravated by the haemoptysis and the result has been

almost uniformly fatal. In case the haemoptysis is not followed by an increase of fever or other untoward symptoms, the patient may experience no unfavorable results whatever from the hemorrhage.

In early cases the physical signs of hemorrhage are usually slight and it is at times impossible to locate the site of bleeding. But in late cases, which are the ones in which severe hemorrhage usually occurs, more or less infiltration with one or more cavities is usually present and the determination of the source of bleeding is usually not difficult.

Dr. Ethan Gray of Chicago called my attention to the fact that in an advanced case in which a cavity has become filled with coagulated blood, there may be more signs of moisture in the opposite healthy lung which has been flooded with blood, giving rise to many coarse moist rales. But even in such cases it should not be difficult to determine which of the two lungs is the seat of the most advanced lesion and therefore the probable source of the hemorrhage.

That there are no drugs which are at all reliable in checking a severe pulmonary hemorrhage is shown by the large number which have been suggested in the past for this purpose and which are little if any used at the present time.

In all cases, even of very slight haemoptysis, the patient should be put to bed and maintain complete mental and physical rest. A small amount of morphia may be given hypodermatically to quiet nervousness and excessive cough. While the morphia is useful in moderate doses, it should not be given in sufficient amount to prevent some coughing, which is necessary to expel blood from the bronchi, or to prevent free evacuation of the intestinal canal with Epsom salts, which should be given in doses of one ounce in as little hot water as possible every six hours until effective. An ice bag should be placed over the heart and the diseased area and the patient assured that he is in no immediate danger.

All stimulants should be avoided. The patient should be given cold liquids such as milk, beef tea or malted milk at regular intervals and be kept in bed at least a week after all blood has disappeared from the sputum. At the end of two or three days solid food may be added to the diet.

For the purpose of promoting coagulation of the blood, horse serum or fresh rabbit serum or calcium chloride may be administered. The former certainly has a coagulating influence on the blood and is much recommended by several

authorities. The horse serum may be given in the dose of ten to twenty cubic centimeters hypodermatically every twelve to twenty-four hours until results are produced, up to six or eight doses. Calcium chloride administered hypodermatically is much recommended in Vienna and I have used it in two cases of severe hemorrhage. In one case it was without effect and collapse of the lung became necessary. In the other it seemed to be of considerable use, the coagulation time of the blood being reduced from fifteen to eight minutes.

Of all the drugs that have been advocated for the control of pulmonary hemorrhage the nitrites rest upon the firmest scientific basis. In a large number of experiments during which forty or fifty of the most highly recommended drugs for the control of pulmonary hemorrhage were used, Macht found that the nitrites were the only drugs which produced contraction instead of dilatation of the pulmonary arteries. These unexpected results have been corroborated by other experimenters, such as H. C. Wood. Amyl nitrite, therefore, may be given on the appearance of a hemorrhage, followed at once by the hypodermic administration of one one-hundredth grain of nitroglycerine, this to be followed by two grains of sodium nitrite every two hours. At times this acts promptly and efficiently.

A drug which I have found to be useful in large pulmonary hemorrhages is atropin, suggested several years ago by Dr. Babcock of Chicago. In doses of one thirty-third to one twenty-fifth of a grain hypodermatically I have seen it check a large hemorrhage almost instantaneously. Its paralyzing effects on the bladder and bowels should be remembered and it cannot be often repeated.

If prompt relief is not secured from the measures already enumerated, especially if the hemorrhage has recurred several times, an artificial pneumothorax should be at once performed. When the source of the bleeding is located and compression is not prevented by extensive adhesions, the hemorrhage is promptly checked by lung compression, even in cases that have resisted all other methods of treatment. When the adhesions are numerous or the pleura markedly thickened or the lung in a state of fibroid induration, a complete pneumothorax cannot be produced and theoretically but little effect could be looked for. Such cases, however, should always be given a trial, as unexpected benefits are frequently met with.

Dr. Ethan Gray of Chicago has successfully

treated twenty cases of haemoptysis by lung compression. In two of these the cavity signs persisted even after the injection of 1000 cubic centimeters of nitrogen, but in each case the hemorrhage was controlled. In two of my cases the signs of cavity persisted, though in a lesser degree, but the collapse secured was enough to control the hemorrhage, so that complete collapse of the lung is not always necessary.

The experience at Bellevue Hospital in New York in which a series of over fifty cases of pulmonary hemorrhage have been treated by this method shows some very striking results.

Practically all operators agree that we have in this operation a certain measure for controlling pulmonary hemorrhage and in the seven cases in which the writer has used it control of the hemorrhage was immediate and complete and permanent. In four of them most of the measures spoken of had been resorted to and the hemorrhage seemed to be uncontrollable.

Lung compression, therefore, may be indicated in any severe pulmonary hemorrhage and should be made as soon as possible to forestall a fatal broncho-pneumonia. Even if the patient has safely withstood one or two large hemorrhages, the advisability of collapse should be considered for the purpose of preventing further attacks with their possible dangerous consequences.

One thousand cubic centimeters of nitrogen may be introduced at the first filling. Later more may be injected, depending upon the symptoms. With a perfect technic the dangers are practically nil. Gray believes that in order to prevent a return of the hemorrhage later the lung collapse should be maintained for at least four months.

Alarming complications frequently follow an extensive hemorrhage such as sudden rise of temperature, rapid pulse, extension of the infiltrated areas and softening of lung tissue. Where one sees such a case for the first time it is not always possible to tell whether the acute broncho-pneumonic process has existed for some time or whether it followed the hemorrhage, in which case, while the bleeding might be controlled, the alarming symptoms would continue and the case proceed to a fatal termination. If the case continues to decline this must not be attributed to the pneumothorax but to the previous condition. The operation can do no harm and the life of the patient may be saved.

If, however, the case seems to be suitable for the continued use of lung compression for the

purpose of curing the disease, the treatment should be continued for an indefinite period to bring about fibrosis.

In a case of hemorrhage one must not be deterred from collapsing the lung by the finding of some disease on the opposite side. Osler states that when the amount of disease in one lung is sufficient to produce changes enough to be recognizable on physical examination, the other lung is already affected. Theoretically the proper case for compression is one in which the opposite lung is entirely healthy. But such cases are almost never met excepting in the incipient stage when hemorrhage rarely occurs.

In the judgment of most men incipient cases are not considered suitable for artificial pneumothorax. Some authorities who have had experience with lung compression in such cases report that they have rapidly terminated in recovery; and as our experience increases it is possible that incipient cases may be more frequently treated in this manner.

Acute, active, rapidly advancing phthisis, often called acute galloping consumption, is stated by some authorities to be unfavorable for pneumothorax. Two of the writer's cases, however, were of this character. Without doubt both would otherwise have rapidly terminated fatally. In each instance complete collapse of the lung was effected and an entire absence of active symptoms was secured in from four to six months of treatment.

It seems to be well established that artificial pneumothorax should be tried in two classes of cases:

I. The advanced case which is going on rapidly to destruction.

II. Advanced cases in which it is evident that recovery will not take place and which are continuing *slowly* towards a fatal termination. If in these cases enough sound lung tissue is left in the opposite lung to keep up aeration artificial pneumothorax offers a good deal of hope to the patient.

Courmot removed three-fourths of the lungs of animals without producing death and all but one-sixth of the lungs of a dog can be collapsed by artificial pneumothorax without killing him. English writers state that artificial pneumothorax may be performed if two-thirds of the opposite lung is sufficiently healthy to carry on the function of respiration. Hence many bilateral cases in which even active disease in the untreated lung is limited to the apex will often show satisfactory improvement

after being subjected to this form of treatment.

A patient in any stage of disease, if markedly unilateral, should have the benefit of artificial pneumothorax if marked improvement is not shown within a reasonable time with the usual methods of treatment, even in cases in which considerable disease is present in both lungs.

If in a bilateral case it is not possible to determine which is the primary focus of disease and which is the secondary one, the side showing the most marked and extensive disease is the one to be collapsed, if the other lung contains enough healthy tissue to carry on the function of respiration. But if neither of the lungs are extensively involved, the collapse must be produced on the side which shows the most active lesion or which contains a cavity. The collapse of the side which was primarily involved and in which the most advanced lesions are found often produces such a marked diminution in the absorption of toxines that a speedy improvement in the cough and expectoration follows, the temperature becomes lower, the pulse rate is reduced and the side which is the seat of secondary involvement is very much benefitted in a short time.

As Von Adelung says "In this procedure we are following Nature's footsteps, securing physiologic rest in a disease in which the value of rest is amply demonstrated; and if we are squeezing infective material from the lung, encouraging fibrosis, discouraging hemorrhage, lessening toxemia and ridding the sputum of tubercle bacilli (all of which seems to be proved), then one queries why this treatment is not applicable to early cases."

In three of the writer's seven cases in which artificial pneumothorax was used for the control of severe hemorrhage, the treatment was continued for curative purposes as follows:

Mrs. C., aged thirty, has had chronic phthisis for nine years during which time she has had the usual exacerbations and remissions peculiar to such cases. In July, 1913, she had two severe pulmonary hemorrhages and expectorated more or less blood throughout the summer. Physical examination and the X-ray showed an advanced lesion involving the entire left lung with a less advanced one in the right. The upper left lobe contained a cavity below the outer half of the clavicle near the anterior thoracic wall and another at the apex near the posterior wall. Scattered infiltrated areas were found throughout the lower lobe with many resonant rales. Kroenig's isthmus was contracted from seven to two and a half or three centimeters. Owing to the advanced fibrosis on the left side, the percussion note of the right lung extended one inch or more to the left of the medium line. The heart was con-

siderably displaced to the left. The introduction of 800 cubic centimeters of gas produced an immediate cessation of haemoptysis and although only a partial collapse was effected there was no return of the bleeding. The lung was kept collapsed for six months. The cavities have almost entirely disappeared, the opposite lung shows a good deal of compensatory hypertrophy occupying a much larger portion of the chest cavity than normal, with breath sounds over its entire area and with full expansion up to its borders. The heart, which during the period of compression was pushed over to the right, is now in apposition with the chest wall in the anterior axillary line, due to contraction in the left lung. The general condition has improved wonderfully, the cough and expectoration almost entirely disappeared, the patient has gained in weight and is now (at the end of a year and a quarter after the cessation of treatment) in as good condition as is possible during the process of contraction which is taking place and which usually extends over a period of several years. She took an automobile ride of 200 miles in one day during the summer without becoming unusually fatigued.

CASE II. Mrs. F. C. W., aged 57. Always in good health until July 1, 1914 when she began to cough and rapidly declined in health. A diagnosis of pulmonary tuberculosis was made and she went to a Sanatorium September 17. Her progress downward was rapid, she lost ten or twelve pounds in weight and was confined to bed constantly. October 1 she had a severe hemorrhage and another October 22. Her pulse was rapid, temperature reached 100 to 103 each day. As her case was considered to be a hopeless one, she was advised to return home which she did November 29. When I first saw her, December 4, she weighed eighty-three and one-half pounds, had a pulse of 130, a fever of two to four degrees each day and a daily expectoration of from three to four ounces. The upper lobe of the left lung was consolidated with signs of a large cavity. The lower lobe also contained scattered areas of infiltration. The apex of the right lung showed slight infiltration. The remainder of the lung seemed normal. As her sputum again became tinged with blood and we all feared the results, in her weakened condition, of another hemorrhage, I introduced 500 cubic centimeters of nitrogen into the pleural cavity December 11, 1914 and followed this up at short intervals until a fairly good collapse of the lung was secured. There has been at no time any return of hemoptysis.

The patient's improvement was immediate and continuous. At the present time she weighs ninety-seven and one-fourth pounds which is as much as she has weighed in a good many years. Her sputum is reduced to one quarter ounce per day, temperature and pulse are practically normal, and she was well enough to take a ten mile automobile ride a week ago for the purpose of having an X-ray picture of her chest taken.

CASE III. Mrs. H. D. W., aged 25. In 1909 had some tuberculous glands removed from her neck. In 1911 expectorated less than a teaspoonful of blood, but was not at all concerned by it as she thought it came from her throat. Always felt strong and well until the birth of her first baby in February, 1914. Did not regain her strength, caught a cold and

began to cough. Two weeks later, on April 11, she had her first hemorrhage and from then until May 27 she had twenty-four attacks of haemoptysis varying in quantity from a tablespoonful to four ounces. There were more large than small ones. The expectoration was two ounces per day before her first pneumothorax operation. She was well nourished, was very weak, had considerable degree of anemia, pulse from 130 to 150, and temperature reached 101 to 103 each day. The upper lobe of the right lung was infiltrated, with two considerable sized cavities. Inasmuch as calcium chloride, coagulin and several other methods for checking pulmonary hemorrhage proved unavailing, and although cases of acute pneumonic phthisis are stated by some operators to be unsuited for artificial pneumothorax, with the assistance of her physician, Dr. R. J. Walker of Saugatuck, on the 27th of May I succeeded in injecting without trouble 1000 cubic centimeters of nitrogen into the pleural cavity. The hemorrhage was at once controlled and there was at no time thereafter any return of bleeding. She received in all twelve injections of gas between May 27 and August 19, most of which were given by Dr. Walker. She remained in bed until September when she returned to her home in the vicinity of Chicago and was put in the care of Dr. Ethan Gray who introduced 100 cubic centimeters of gas September 29, 60 cubic centimeters March 6, and 100 cubic centimeters March 30, 1915. During the spring she developed a sero thorax.

At the present time the patient is in splendid physical condition, is up and about attending to her usual duties, has no cough and but very little expectoration repeated examinations of which have been negative, has a normal pulse and temperature and weighs 148 pounds.

Based as it is upon sound clinical and pathological observation, artificial pneumothorax has become a well established therapeutic measure in the treatment of pulmonary tuberculosis. Clinical experience all over the world has proven its value and thousands of cases which were otherwise doomed to die have been saved by this operation.

#### DISCUSSION.

DR. A. W. CRANE, KALAMAZOO: I have been interested in Dr. Johnston's work on pneumothorax. It seems to me a matter of very great importance, and his results have been so brilliant as to doubtless influence a great many physicians to use this method. Personally, however, I have not happened to have any experience with it. At one X-ray meeting in Chicago, I saw a very large number of slides given where the pneumothorax had been governed by the X-ray observation, and incidentally it came up that the results of the pneumothorax treatment had been satisfactory and that, properly applied, it was one of the most efficient therapeutic means at our command. I remember among the first good X-ray demonstrations of lung lesions which I saw years ago, one was in connection with a paper by Dr. Murphy given in Denver. He had employed the method of injections into the lung, and the paper at that time made a great sensation, but later the treatment seemed to have fallen into disuse. I think Dr. Johnston has been instrumental in reviving the use of this treatment throughout the country. I was especially interested in what Dr. Johnston said about the control of pulmonary hemorrhage by means of the nitrates. It was new to me that the nitrates cause a contraction of the pulmonary vessels, while they cause dilatation of the vascular system throughout the rest of the

body. If this is true it would seem to be the ideal drug to be given in such cases.

In regard to the other papers on tuberculosis, the general summing up contained in Dr. Johnston's paper covers the whole subject, and the indications for the diagnostic use of tuberculin I never have heard better put. We can rely on it as a means of detecting the presence of tuberculosis, but certainly it requires very careful interpretation to judge from its use whether or not we have an active lesion of the disease.

DR. E. L. EGGLESTON, BATTLE CREEK: For some years we have been promising ourselves that the time would soon arrive when tuberculosis would cease to exist. We saw new methods of handling these cases, and the cure would take place in practically the large majority of cases except those in the far advanced stages. Now the later statistics are rather depressing to see, and we find that we have not accomplished as much as we anticipated. It has now been shown by some observations that over 70 per cent. of all children that have been in homes where tuberculosis has existed have become infected, and these 70 per cent. are all possible cases of tuberculosis. Now it is true that they may not develop tuberculosis actively, but they are all possible cases. Now, unless there is some possibility of immunizing these cases it does not seem to me that we have accomplished very much, or we will accomplish very much in the next years to come. But if there is a possibility, as has been intimated by Von Rucke and Pottenger—although these men have been rather severely assailed because of their statements along this line, I believe—but if there is a possibility by means of vaccination of immunizing these cases of young people or infants that have been known to have been infected, by being brought in close contact with the disease, then it seems to me that there is a possibility of blotting out this dread disease. It seems to me that the medical profession must do more than they have done, they must find out these cases that have been infected, and these must be thoroughly examined and re-examined and if there are any indications at all as shown by the Von Pirquet or other tests—if there are any symptoms at all of activity, then it seems to me that active measures should be employed.

My observation of the use of tuberculin is that it is certainly of value. I have seen a number of cases treated in the past two or three years where the results have been very encouraging. In fact, it seems to me, that it warrants more attention from us than it has received.

DR. R. B. HARKNESS, HOUGHTON: I want to congratulate Dr. Johnston upon having placed the Von Pirquet reaction upon a very definite basis. I think the majority of men regard it too highly and he has lined it up very nicely; that is, he has stated that it has a very definite value up to four years, it has a significance up to about twelve years, and it has no significance later when it is positive, but a very definite significance when it is negative.

In the matter of diagnosis, I think that perhaps he does not give enough credit for the X-ray as a method of diagnosis. I happened to be with Dr. ——— when he was working this up with Hamburger, and he has perfected very greatly the use of the X-ray in diagnosis and found that with an intensifying screen an exposure of about one-twentieth of a second showed changes in the lungs of children when they are very minute, and as a method of diagnosis and as a method of practice in the physical examination of children it is extremely valuable; that is, if an X-ray is taken of these children and kept for record. The child is gone over for physical signs and the X-ray is taken and you observe your mistakes when it is compared with the X-ray; then you keep a permanent record of this plate and go over the page as many times as possible, and physical findings which at first seem absurdly small have a very definite significance in children. The X-ray, from being a plaything in the diagnosis of tuberculosis of children, has become a very valuable means of diagnosis, only it is not fully used or appreciated.

DR. BENJAMIN A. SHEPARD, KALAMAZOO: Several of the speakers have congratulated Dr. Johnston upon this paper and I think that ought to be turned around a little; I think that we are to be congratulated in having Dr. Johnston in our midst. I believe he has done as much as any other man in this vicinity to encourage the early diagnosis of tuberculosis, and I have seen considerable of his work. There are some things I wish to emphasize. Dr. Johnston spoke of the history being important, and this cannot be emphasized too strongly. Often it is the history alone that will put us on the track of the disease, so we will not too soon dismiss the case without more thorough investigation.

In regard to the Von Pirquet test, I never can let that go by without challenging some of the statements. In regard to the statement that it is good up to twelve years, I would add eighty-eight years to that at least. The Von Pirquet test, or

any other tuberculin test properly used will give information almost any time, or may give us information almost any time. The proper interpretation of a Von Pirquet test, upon that depends its value. The mere presence of a positive tuberculin test is of little value, it is the kind of reaction that you get—that is my opinion, at least. I do not believe that we ever see a marked Von Pirquet reaction in an old healed lesion; at least, I have given several hundred of them and I believe that I have yet to see the first real marked positive Von Pirquet in which there is an active lesion that could be demonstrated.

The examination of the sputum—of course, if it is positive it is very important, but a negative finding in any sputum means little. It means if we do get it that we have got an advanced case; that the tissue is breaking down and germs are being thrown out into the bronchi—that there is sloughing tissue and the tissue has been there a long time, unless in some rare cases it is almost accidental.

As to the use of potassium iodide in tuberculosis, in most cases I believe it is contraindicated. Potassium iodide tends to break down freshly formed fibrous tissue, and in the healing of a tuberculous lesion we hope, at least, to get the formation of fibrous tissue, and if I understand the action of potassium iodide it will tend to break down; that is so true that many of the older textbooks advise the giving of large doses of potassium iodide and the examining of sputum, because you will find it then if you did not before, owing to the fact that you have broken down some of the freshly formed fibrous tissue and there is a freeing of the germs.

One thing I would like to emphasize that was brought up by Dr. Rawlings is the slowness, the slow course which an old, senile case runs. I believe that occurs because we have as a rule few bodies in the nasal pharynx to interfere with the free entrance of air. The lung tissue has all of the upper air passages comparatively free. In children we find adenoids and enlarged tonsils and we find tissues there which should not be and that hinder the entrance of oxygen, the entrance of air into the lungs; so that we should emphasize in every case of tuberculosis the thorough examination of the upper respiratory tract, making sure that the patient is getting all the air which can possibly get through and that there is nothing hindering its passage.

DR. G. E. McKEAN, DETROIT: I wish to speak of the use in oozing cases when you have not a coagulant, or even if you have a coagulant, of the injection of a hypodermic syringeful of blood taken from a near relative of the patient into the tissue of the patients themselves. It will do the work fully as quickly as coagulose or as any of these agents and just as safely and it is always at hand. In regard to the use of morphin in hemorrhage, I would hate to lay it aside even for nitroglycerine or any of the other drugs recommended on account of the control of the patient's mental attitude, if for nothing else. The only danger of morphin in controlling a cough is that of allowing the patient's lungs to be flooded with the blood that is flowing out.

DR. McDONALD, DETROIT: I think much can be said in commendation of the papers that have been read and especially of Dr. Jackson's and also Dr. Rawlings'. I think Dr. Jackson gives us an insight of what we should do at the very beginning of a childhood's disease. It gives us an inkling of what we ought to do towards the protection of every child that comes into a family. How often do we see the picture of babies going into a clinic or a hospital and dying in a few days with tubercular meningitis. How do they contract this? Probably from coming into direct contact with a tubercular grandfather, or aunt or uncle, or somebody who has nothing to do but sit around the home and take care of the baby. The child is on this relative's lap and is being caressed and kissed and in that way the condition is carried on down to the next patient. It shows how careful we ought to be in making a diagnosis in parents or in some of the members of the family that may have tuberculosis. We can get at it from the sunlight side with tuberculosis and our treatment of some of these cases that we get in the Children's Free Hospital has been from this standpoint.

DR. V. C. VAUGHAN, JR., DETROIT: The points I would like to speak of with regard to tuberculosis in children are principally in relation to tuberculin. It has been our experience in Detroit, from a large clinical observation, that children do not show a large number of physical signs, the bronchial breathing in the child's chest overshadowing any slight physical changes which may give rise to signs noticeable upon auscultation. We have during the past year, among 787 cases, had a percentage practically one-third early, one-third moderately advanced, and one-third advanced, which shows that we have at least obtained a relatively accurate survey of all cases of

infected individuals not limited simply to the moderately advanced and advanced cases. Our early cases are found in individuals under fourteen years of age, and they are cases which are brought in by nurses as a result of association with tuberculous individuals. We find that these children give positive tuberculin tests, run an afternoon temperature of from 99½, probably, to 100 degrees, and show very few physical signs. We think that these children are tubercular and certainly the only way to treat such children is on the assumption that they are tuberculous at that time. We keep these children under constant observation, having them return frequently. Some of them are even placed in sanatoria. Others are put into open air schools where they are kept under weekly supervision.

With regard to the temperature, I believe the temperature is more common in the early stages of tuberculous infection and I believe that the tuberculous temperature is not a high temperature. Under ordinary circumstances, as a matter of fact, I believe that the characteristic temperature curve of a tuberculous case is rather one of great variability than one of high temperature; a greater range between the low temperature and the high temperature, a greater fluctuation than is found in the normal. We will find a subnormal temperature in the morning, associated with a temperature of 99½ in the afternoon. Now, this temperature corresponds in a general way to the tuberculin reaction which occurs. It is a well known fact that the largest percentage of positive tuberculin tests are found in the early cases; an intermediate percentage of moderately advanced cases react to tuberculin. I believe that the temperature which we find in the early cases is associated with the process of reaction which is manifested by the positive tuberculin reaction. As the disease progresses and as it becomes more chronic, we have less and less temperature and, as Dr. Rawlings has so accurately brought out, in elderly patients we very seldom have any temperature at all. Now, I think that we sometimes confuse the temperature which we find in advanced and moderately advanced cases with that of the true tuberculous infection temperature. For example, I believe that the fever, associated with chills, which we find in individuals with cavity is due entirely or very largely to the secondary infecting organism and not to the primary tuberculous focus. We have found three cases of acute miliary tuberculosis in children, found in them tuberculous meningitis, which is but a manifestation of an acute miliary process in the majority of cases, in which we could find no source of infection until we examined the sputum of grandparents who were apparently well, except that they had a chronic bronchitis and had lost a little in weight, as elderly people should; there we found the sputum filled with tubercular bacilli. Now there was no question about the virulence of the bacilli in those cases and I think that is a very important question and one we must consider thoroughly.

DR. COLLINS H. JOHNSTON, GRAND RAPIDS: I would like to have some information upon Von Ruck's serum and whether it may be a help in immunizing against tuberculosis, as I think Dr. Eggleston suggested. You have had a lot of work with tuberculin in general.

DR. V. C. VAUGHAN, SR., ANN ARBOR: Von Ruck's serum has been tested by a special committee appointed by the Government and found to be absolutely worthless; that is all there is to it.

DR. C. H. JOHNSTON, GRAND RAPIDS: I have not much to say in closing, except to refer in a word to use of tuberculin. I got a lot of help from it and I agree with everything that has been said by Dr. Jackson and even the other speakers. I have had much from it. In the first place Schick, Von Pirquet's first assistant, told me that Von Pirquet got from 75 to 90 per cent. of reactions in everybody perhaps after the fifteenth or eighteenth year of age referred only to the large clinics in the cities and to work in large cities like Vienna where tuberculosis is more prominent than in other cities; and, as Schick says, those results did not refer to the country at all. I do not believe that in a city like Grand Rapids, or in a country district we would get any large percentage of reaction. If I get a little reaction it helps a great deal. If it is positive it does not show disease; it only shows infection, and then the clinical investigation will show if that is a case of disease. Every child has measles and a large percentage become infected, but it does not indicate disease any other way. I get help from tuberculin as testing out children in tuberculous families, when I am able to give every child the tuberculin test. Every now and then my record will show that after three or four or five tests I get no reaction whatever, and then I test it six months later and I get a good, positive reaction; then I look up the temperature and find loss of weight and rapid pulse, and I pick up quickly and early in its course a case of active tuberculosis in a

child. I think of one now, where I had been giving a boy twelve years old a test every six months for five or six years, always with negative reaction. In February, I got the positive reaction; then I found a little temperature and rapid pulse. A month later he spit a little blood, and I have had a beautiful case of acute tuberculosis. He is now in a stage of recovery, that being six months ago. In that way, followed up, I think you get a lot of help from it.

DR. JOHN B. JACKSON, KALAMAZOO: Just one word in regard to the value that I spoke of the X-ray. I did not wish to give the impression that I thought the X-ray was not of extreme value in the diagnosis of children. I merely wished to emphasize the fact that negative X-ray findings were not sufficient to say that the child did not have tuberculosis. I am aware that the records that I give were from the records of the large clinics and that probably the problem of tuberculosis is not as great in the country districts and smaller cities as the records of the clinics would lead us to believe and yet I believe that perhaps reporting these records in this discussion may increase interest in the early diagnosis of tuberculosis in children. It is much more frequent than we have been led to suppose, I am sure.

### RETROCECAL APPENDICITIS.\*

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Although this type of appendicitis is rather infrequently mentioned in the voluminous literature upon the general subject of appendicitis, yet the deviation of its essential characteristics from the ordinary form entitles it to especial consideration.

In early days it was thought that the most frequent direction of the appendix was inward, or downward and inward, but later investigations proved that this was true only in about 60 per cent. of cases. The cecum varies considerably in position and with it, the appendix, so that the appendix has been found to lie in almost every conceivable location within the abdomen, which its length and the extent of its mesentery would permit it to attain. Cunningham (1) states that the retrocecal position has been considered the normal one by at least "one or more observers." This position has been found by various operators to occur in from 15 to 35 per cent. of all cases.

Carmicheal (2) reports 33 per cent. of retrocecal forms in 102 cases. Eisendrath (3) states that "over 30 per cent. of cases are retrocecal." Jackson (4) says that in his experience 20 per cent. are retrocecal. In my last 200 cases in which accurate records of the position of the appendix have been kept, I have observed thirty-five or 17.5 per cent. to be of this variety.

Anatomical researches confirm the above statistics, thus: Byron Robinson (5) found the appendix retrocecal in 35 per cent. of 300 bodies examined; Monks and Blake (6) in 18

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per cent. of 582 cases; Boody (7) in 16 per cent. of 509 cases.

We have considered the appendix retrocecal when it was turned in an upward direction behind the cecum or ascending colon; it may be partially or wholly retroperitoneal; it may possess a partial mesentery or no mesentery at all.

The chronic and subacute varieties are of little more interest than the ordinary chronic and subacute varieties with the exception that these present a greater element of potential danger and the removal of the offending organ requires, at times, a higher degree of technical skill. It is with the acute forms that we are mostly concerned and these only will be considered at this time.

The pathology depends largely upon two factors: first, the relation of the appendix to the parietal peritoneum; secondly, the character, intensity and duration of the infection. If surgical measures are instituted early, the pathological process may not have extended beyond the walls of the appendix, but if the case is seen late and the retroperitoneal portion of the appendix happens to be the part diseased, then one of the following conditions may obtain:

1. An appendix wholly or partially gangrenous.
2. Perforation or abscess. If the latter has taken place the abscess may be confined behind the caecum, pushing the cecum forward. In this form the cecum is frequently forced into the incision on opening the peritoneum.
3. The abscess may pass upward to the lumbar fossa. (In the prone position the lumbar fossa is on a lower level than the iliac fossa.)
4. It may extend upward to the liver, forming a subhepatic abscess.
5. It may go further and reach the subphrenic space forming a subphrenic abscess and later rupture into the pleura or even into the lung, if lung adhesions are present, and may be coughed out through the trachea. Jackson (4) reports a case of this kind with a rupture so profuse that the patient was suffocated by the exudate filling the lungs.
6. It may force itself downward into the pelvis.
7. It may drain downward posterior to the peritoneum, separating the peritoneum and point, in a similar manner, to a psoas abscess, just above or just below Poupart's ligament.
8. It may burrow through the transversalis fascia and the muscles of the abdominal wall and pass downward underneath the fascia lata into the thigh.
9. It may break into the colic veins and cause multiple abscesses of the liver.

We have endeavored by a search through medical literature and analysis of our own cases to find, if possible, a definite symptom-complex distinctive of the retrocecal form of appendicitis,

and while we have not found that which we sought, we have reached the following conclusions.

As compared with the ordinary form of appendicitis we observe:

1. That the pain, nausea and vomiting are more transitory;
2. That fever more commonly persists after the pain has disappeared;
3. That tenderness is the most constant physical sign and that it is localized usually at a point external to McBurney's point i. e. in the loin just above the iliac crest;
4. That muscle tension is frequently absent;
5. That persistence of fever with disappearance of the other symptoms has led to mistaken diagnoses of typhoid, paratyphoid, malaria, infection of obscure origin etc.;
6. That some cases are so obscure that if the attack happens to be a mild one the source of infection may not be discovered until operation, if severe and if we are so unfortunate as to lose our patient, the source of infection may not be revealed until autopsy.

A carefully taken history with especial attention to the early signs will usually enable one to make an accurate diagnosis. The symptom-complex observed in most of our cases has been as follows: pain, epigastric at first, gradually becoming localized in the loin above the iliac crest; nausea and vomiting, then fever; all disappearing after a few hours with the exception of the fever. In some cases fever has been the only symptom elicited. The chief physical sign has been tenderness localized external to McBurney's point. The muscular rigidity usually present in acute appendicitis has frequently been absent in our retrocecal cases. In thin individuals where abscess has formed, it has frequently been possible to palpate the abscess as a distinct tumor and to observe that this tumor had no connection with the anterior abdominal wall. Percussion may or may not reveal an area of changed resonance due to a subjacent or underlying mass purulent or otherwise. The dullness when present will often disappear and in a few hours reappear. This phenomenon has been interpreted as being dependent upon a varying gas content of the cecum.

A history of previous attacks of appendicitis may often be a deciding factor. Absolute and differential leucocyte counts carefully made and frequently repeated have been of value.

The possibility of referred pain must ever be borne in mind and the following conditions excluded:

Infection of right kidney.

Right ureteral calculus.  
Floating kidney with a twisted ureter.  
Right pyosalpinx.  
Right ectopic gestation.  
Ovarian cyst with a twisted pedicle.  
Acute cholecystitis.  
Acute cholelithiasis.  
Typhoid fever.  
Hip joint disease.  
Disease of the Psoas muscle.  
Abdominal tuberculosis, etc.

Prognosis of retrocecal appendicitis depends among other factors upon: 1, the virulence of the infection; 2, the extent of the infection; 3, the patient's resistance; 4, the skill with which the case is managed. As a rule it is more serious than any other form excepting that which is accompanied by a general peritonitis.

Dogmatic rules in surgery will always have exceptions. However, it is now quite generally conceded that the best treatment consists in removal of the appendix as soon as the diagnosis has been made. When the appendix has ruptured and peritonitis has supervened, whether or not the appendix shall be removed at once or left for a subsequent operation, is not always easily determined. My plan has been to individualize cases and to adopt that form of treatment best suited to each case. One point of difference in treatment from the ordinary type lies in the site chosen for drainage in abscess cases. This should always be placed at a point where the abscess will evacuate itself to the best advantage. A few may be drained anteriorly, many through a stab wound external to the original incision, but the majority of cases will best be drained posteriorly through the lumbar region. If drainage of an ordinary abscess is an important factor in treatment, drainage of a postcecal abscess is doubly important because the arrangement of the postcecal structures offers little resistance to the spread of infection.

Our thirty-five cases may be classified as follows:

1. Retrocecal with a partial mesentery, 12;
2. Retrocecal without a mesentery, 6;
3. Abscess, 17.

The appendix was removed at first operation in all cases except eight.

I have since removed the appendix in two of these eight cases.

The large percentage of abscesses in this series is an illustration of the difficulties encountered in diagnosis. Some of these abscesses were small and not suspected until revealed by operation.

Some of our cases possessed unusual interest.

In one the appendix was firmly attached to the lower pole of the right kidney. Infection had evidently passed from the appendix to the kidney, a portion of the lower pole of the kidney showing an infected mass, while the remainder of the kidney was apparently healthy.

Another died of multiple abscesses of the liver.

A third had been diagnosed as carcinoma of the cecum. This patient was given a bismuth enema and radiographed, when a postcecal appendiceal abscess was plainly evident.

A fourth developed intestinal obstruction five days after operation, ileum to cecum; reoperated and relieved. Was doing nicely when one week later developed a volvulus of the small intestine on the left side of the abdomen, third operation, relieved.

A fifth developed as a post-operative complication a subhepatic abscess which was subsequently drained. Three cases developed intestinal obstruction while still in the hospital and secondary operations were necessary.

It would seem that the dangers and difficulties attending removal of an acute retrocecal appendix are a good argument in favor of the course adopted by the large majority of abdominal surgeons at the present time viz., routine examination when possible of the appendix during all laparotomies, with removal of the same if its position is found retrocecal or retroperitoneal or otherwise misplaced or if revealing evidence of past or recent disease.

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#### DISCUSSION

DR. J. J. REYCRAFT, PETOSKEY: I had not thought to discuss this paper, but you will be compelled to hear from me a little, I guess, on this subject. I feel a good deal like Mark Twain. When asked to go on the platform, he wrote declining, in part because he never expected to appear on a platform again except at an affair of his own making and this afternoon after the nice, warm reception I got yesterday I feel almost terror stricken at appearing before you.

I do not know of anything that could make me talk better than this very subject that we have to-day, appendicitis. It is as old as the hills. It is a subject that has been discussed from all angles and yet there is always something new. I have operated myself so many times in this condition and I feel so much at home in it and like to get hold of a case that I am familiar with. Certainly, the matter of appendicitis, the kind of appendicitis that we have had here today, is open

to discussion. We find, I think, not as many as the essayist states—I did not believe that we found so many appendices in this position—but we do have some; and when we have it in that position, we usually have it as the result of a former attack. When you come to operating on it, you will find that it is harder to operate. You do not have any meso-appendix, you find the appendix embedded right in the wall. The operation that the essayist showed for removing the appendix, by cutting in along where it is, is a very good one. As far as burying the stump, that is useless. I have not buried the stump five times in over 700 operations. Particularly in the operation shown here, I do not see why it should be buried. There is a point that I follow—it may be of interest to some of you—and that is to take the appendix where it comes off the cecum in these cases—and, by the way, I think it is one of the best operations we have, devoid of spreading infection, devoid of hemorrhage, devoid of cutting into a lot of new tissue where you have a large surface with adhesions forming later—pick up the appendix and tie it at the cecum, go on a little bit further and tie it again. You have two stumps. Use them the same as you would one. Leave the appendix in if the lumen of the appendix is destroyed. In many, many cases you will never hear from your appendix again. I think that is the proper way to serve it. It is not necessary always to cut your appendix out because that appendix is going to die and get out of the way.

Never would I think of leaving an appendix in an abdomen that I had started to operate on, particularly in an acute appendicitis. I always remove the appendix if it is not walled down. The matter of an intermediate operation, an interval operation, to me is nonsense. No man can take an abdomen full of pus and get good results from it by leaving in an appendix that is rotten. Take them all out. We do not have a big death rate when we do it. I do not know that I am borne out in my statement by many men who have large surgical practice, but I never left but thirteen appendices in the abdomen in my life when I opened for that purpose. There is not the danger of spreading infection by taking out a gangrenous appendix, and I want to tell you that my experience has shown me that it is the only way. You may not find it right, and I would not want you to write death certificates, but in the future, Doctor, try it. Do not say, "We will wait, we may not have appendicitis, we may have typhoid and the like, we will take the pus, or the blood rather, and find out whether we have a leucocytosis, whether we have anything." My experience is that I would rather operate twenty times and not find anything the matter with the appendix than to neglect one case and have it die. You will never lose a patient looking into the abdomen under aseptic conditions. The patient you lose is the one that you let stand.

I have not time, gentlemen, to go into this subject as I would, but I think the paper was admirable and I thank the Doctor for the many points brought out in the paper. It suits me as well as any paper on appendicitis that I have heard for a long time. I am very glad that I could discuss it with you.

DR. H. E. RANDALL, FLINT: It seems to me that the most important thing in this paper—Dr. Hewitt hinted at it, but I do not think that he made it strong enough—is the fact that all cases of retrocecal appendicitis are mild cases. They are the cases that go along the street, they are busy men who keep at their work, the patient does not show much rigidity of the right rectus. The doctor may be surprised in making the blood count to find that the man has a high leucocytosis and a high percentage of "polys." The last year or so I have been observing these cases with this in mind, that in those cases where we do not have rigidity of the right rectus, so far as I have seen, we have had rigidity of the external oblique muscle. I think that is an important thing. When the appendix lies free in the abdominal cavity, the pain is more severe, they vomit more, they have a higher temperature. Many of these retrocecal cases do not have very much temperature, they do not have much rigidity, and in every one of the cases that I have found so far with rigidity of the external oblique the appendix has been retrocecal. I am convinced that very many of these cases are not retroperitoneal, they are retrocecal in the sense that they lie close to the peritoneum, the exudate agglutinates them to the posterior peritoneum, and many of these cases we classify or they used to classify as retroperitoneal.

Dr. Reycraft, I think, made a little misstatement in saying that the appendix should come out in all abscess cases. I think that should come in the large majority of the cases at the time that the hand is in the abdomen; you feel your appendix and you can tell whether it is in the abscess wall or not. It is not a good thing to take that appendix out and spread pus into the abdominal cavity, but if you can get it out without

breaking up your wall, it is advisable to do it; the cases get on better and it does not mean a secondary operation.

DR. H. W. HEWITT, DETROIT: I was in hopes that the paper would be very freely discussed because there are a great many points that I could not bring out in such a short paper and especially elaborate upon. The point made by Dr. Randall, about these cases being mild, we have found to be true. A great many cases are ambulatory, but we have also found that some cases have been very severe; for instance, the case I showed on the screen, in which there was an abscess of the liver. I operated on that patient within twenty-four hours after the original attack and I believe that the patient had had that abscess of the liver before we operated. His temperature was high and after operation the temperature did not go down. Most of our cases have been not entirely strictly retroperitoneal, as Dr. Randall has said. They have been partially retroperitoneal and partially preperitoneal. I do not quite agree with Dr. Reycraft on one point and that is always removing the appendix. I believe that it is a little bit safer in some cases to leave it and to go in after that appendix at some future time.

### CONGENITAL HYPERSTROPHIC STENOSIS OF THE PYLORUS.\*

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Congenital hypertrophic stenosis of the pylorus in infancy has lately been brought prominently to the attention of the profession and cases are being constantly reported. The earliest known case was described by Bardsley in 1788, but it was just one hundred years later when Hershsprung described cases and drew attention to the subject again. From this time on cases were occasionally reported, but it has only been within the past five years that physicians and surgeons have come to realize that this disease was not so extremely rare as has been supposed, but was simply not being recognized as a clinical entity.

Holt and Downs of New York have each within the past year made reports and published articles covering a total of seventy cases of this disease, together with their conclusions as regards diagnosis, pathology and treatment. Some of the latest works on surgery refer to this condition and some of them give pretty accurate descriptions of the symptoms together with a discussion of the diagnosis and the indications for treatment, both medical and surgical.

Lewis and Grulée, in the early part of the past year, report upon a case of pyloric stenosis in an infant in which they had an opportunity to make a post mortem examination of the stomach 256 days after an operation which was a gastro enterostomy. They found the pylorus still closed and with no apparent change in the condition of pyloric hypertrophy and stenosis.

This disease occurs most often in breast-fed babies and comes on in from three to six weeks

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after birth. It is characterized by a peculiar propulsion vomiting after each feeding which is persistent and with only short intervals of relief. This is followed by failure of weight, retraction of lower and bulging of upper abdomen, and parastaltic waves passing from left to right in the stomach region may often be seen. In some cases a tumor about the size and shape of an olive may be felt in the region of the pylorus. Syphoning out the stomach contents with a large catheter will show stasis and the diagnosis can easily be confirmed with the X-ray.

Many theories have been advanced as to the cause of the hypertrophy and the resulting stenosis, but nothing is definitely known. Pathologically it is known that there is an hypertrophy of the pyloric muscle with, in many cases, a considerable increase of connective tissue. There is no doubt that in many cases, especially those which recover under medical treatment, there is nearly a spasm of the more or less thickened pyloric muscle.

The etiological factors underlying this very interesting condition have not as yet been definitely worked out. Medicinally, this disease may be treated by irrigation of the stomach, careful dieting as to amount and intervals of feeding, character of food, etc. and if the case is one of pyloric spasm recovery may take place. If there is no improvement after a few days treatment or it becomes apparent that there is an organic lesion present, operation should be performed at once and it is the concensus of opinion that a posterior no loop gastro enterostomy is the preferable operation in these cases.

I had an opportunity to see a few cases of this disease in Boston in 1911, and in November of 1914 was called to see a child in the country which presented symptoms of this disease. The child, a female, was a breast-fed baby, plumb, well-formed and healthy at birth, weighing nine pounds, and continuing well until three weeks of age when she suddenly began to vomit. This continued with varying intervals of relief for three weeks at which time I first saw the baby which presented a very striking picture—emaciated, weighing seven pounds, with a retracted lower abdomen and bulging of the upper abdomen. Parastaltic waves could be distinctly seen passing from left to right and reversed. No palpable tumor could be felt, but the vomiting had the peculiar expulsive quality characteristic of this disease. I made a probable diagnosis of

pyloric stenosis and had the patient removed to our hospital where aspiration of the stomach contents and X-ray negatives were taken confirming the diagnosis. After carefully and repeatedly washing out the stomach to remove the bismuth and retained food, an operation was performed under light ether anesthesia, assisted by the local use of  $\frac{1}{4}$  per cent. novocain and adrenalin.

The operation consisted of a posterior gastro enterostomy by the suture method through a right rectus incision, and required but forty minutes time. The child made a good ether recovery but in spite of transfusion, warmth and food after six hours, etc., she died about eighteen hours afterwards. I fortunately was able to obtain the consent of the parents for a post mortem and the removal of the stomach, and the specimen, as you see it, shows the condition of the pylorus very nicely. There is a hard hypertrophic mass occluding the pylorus with the mucous membrane in folds. At the post mortem there was no sign of hemorrhage or leakage of the enterostomy and I believe that if the operation could have been performed earlier, the child's chances for recovery would have been much better.

My excuse for making this report is the comparative rarity of this disease or at least of its recognition, the very recent beginning of our knowledge of this very peculiar condition. As we can easily recognize the importance of early diagnosis in its relation to successful treatment, if this disease is always kept in mind, in such cases, the diagnosis is much less likely to be overlooked. Also, the fact that an opportunity to hold a post mortem in such cases does not often occur.

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#### PRELIMINARY REPORT ON INTRASPINAL INJECTIONS OF MERCURIALIZED SERUM FOR CEREBRAL SYPHILIS.\*

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Never in the history of medicine has there been such a revolution in the conception of the pathology and the treatment of any disease as

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there has been in the past decade with regard to that of syphilis. This disease, probably affecting at least one-twentieth of the human race, has, in certain of its manifestations, resisted treatment and even investigation, for centuries, despite the fact that some of the best minds in the scientific world have been directed toward its study.

About ten years ago Schaudinn and Hoffman discovered the organism which is the cause of the disease, namely, *treponema pallidum*, which furnished a new basis and a fresh start for more thorough and positive investigations.

The next notable achievement was performed by Ehrlich in his laboratory investigations for the discovery of a cure for sleeping sickness. Chiefly as an accident connected with the investigation, he brought forth for the treatment of syphilis the remedy known as salvarsan (606) or more scientifically speaking, Dimethyldiamidoarsenobenzol. The treatment of primary, secondary and tertiary syphilis immediately underwent a revolution and at the present time has been placed upon a fairly good working basis.

There remained, however, one class of syphilitic diseases which did not respond to the new treatment. It has long been known that the so-called para-syphilitic diseases, notably tabes and general paresis, were syphilitic in origin. In fact Fournier early placed them in the list of those diseases of which syphilis was the causative factor. It remained for Noguchi, however, to demonstrate the *treponema pallidum* in the central nervous tissues in persons suffering from these diseases. Within the last two or three years, therefore, we have come to regard the para-syphilitic diseases not as para-syphilitic at all, but as strictly belonging to the category of true syphilitic diseases.

The question then arose as to the reason why these forms of syphilis do not respond, as do the other lesions, to the specific medication discovered by Ehrlich. At first it was thought that perhaps the changes of the nervous system, due to syphilis, had so altered the nerve cells that restoration of tissue, and with it function, was impossible. The second explanation for failure to obtain results from ordinary medication in cerebrospinal syphilis was that perhaps the drug did not reach the seat of the disease. Investigations took place upon both of these hypotheses and the second one has been practically proven to be correct. It has been shown by various investigators, among them Pettit and Girard, that the cerebrospinal fluid is

not a transudate, as had been supposed, but that it is an external secretion of the choroid plexus. In other words the choroid plexus exercises a selective action upon drugs and other substances which pass through the general circulation and from there into the spinal canal.

The experiments of Frasier of Philadelphia, of Goldmann and of Dixon and Halliburton, and others, have tended to confirm this opinion. As a further proof it might be mentioned that arsenic and mercury, when injected into the circulation have been found in the cerebrospinal fluid either not all or in extremely small amount; the amount in all cases being too small to have any definite effect or therapeutic value in the treatment of the disease.

Camp studied the spinal fluid of seventeen patients who had received intravenous injections of salvarsan and in none of these cases did he find any evidence of the drug in the spinal fluid. These examinations were made at variable intervals after treatment and in only one case, in which large and repeated doses were administered, was there the least trace of arsenic found. Some, however, have reported very minute quantities.

The theory that the central nervous system is not attacked until late in the disease, say the tertiary stage, has also proven untenable. Wile and Stokes have shown that there are positive evidences of involvement of the central nervous system in the secondary stages of the disease, as proven by their study of the spinal fluid in a number of cases at University Hospital recently. These cases were all of secondary syphilis, which were undergoing treatment at University Hospital. Two-thirds of these cases showed evidences at this stage, in the spinal fluid, of the involvement of the central nervous system. He states that from this result we must conclude that this does not represent the whole number who will at some time show or who have already shown, a reaction on the part of the central nervous system and also that the absence of findings indicative of meningeal reaction in a single examination cannot be taken as conclusive evidence of freedom from central nervous involvement. He concludes:

"Comparing this high ratio of early involvement with the relative low ratio of late involvement, as compared with the total number of syphilitics, we must conclude that the early involvement is for the most part a transitory manifestation. The central nervous system is particularly likely to show involvement in case the eruption is papular or follicular type. Marked subjective symptoms such

as headache, insomnia, and nervous irritability, were for the most part accompanied by positive findings in the fluid in our cells. In a general way cases in which there had been late or no treatment showed a higher percentage of involvement than those in which vigorous treatment had been inaugurated. The common finding indicative of meningeal reaction was the increased globulin and albumin content; positive Wassermann ranking next and lymphocytosis last."

As an aid to diagnosis and as a possible guide to prognosis, the value of the spinal puncture in cases of secondary syphilis can scarcely be over-estimated. This fact of the disappearance in a large number of cases, especially those who had been subjected to vigorous treatment, of the evidence of central nervous involvement in later years, after the disappearance of secondary and tertiary symptoms, seems to indicate that the ordinary and general treatment used in the early stages of the disease will prevent the later manifestation in a certain proportion of cases. Nevertheless when the central nervous system has finally become involved in either the form of tabes or general paresis, the ordinary medication accomplishes next to nothing.

As a result of this failure in treatment various other methods were devised for reaching the seat of the disease and Swift and Ellis were the next investigators to make a decided advance along this line. They introduced a method of administering salvarsanized serum directly into the spinal canal. The method is described briefly by Kaplan as follows:

"The patient receives an intravenous injection of 0.5 gm. salvarsan, in the majority of cases, given in the usual manner. One hour after this administration enough blood is withdrawn from the patient's vein to give at least 15 cubic centimeters of serum. The blood, obtained under aseptic precautions, is permitted to coagulate, and is then placed in the ice-chest overnight. Next morning the separated serum is very carefully decanted off into a centrifuge tube, and permitted to centrifuge for about half an hour. The clear supernatant serum is pipetted off from the few red cells at the bottom, and poured into a graduated cylinder up to the 12 cubic centimeter mark, and then brought up to 30 cubic centimeters by the addition of sterile 0.9 per cent. NaCl solution. This is placed in a 56° C. thermostat for thirty minutes, to avoid danger of contamination and the mixture of serum and salt is injected at body temperature.

"The lumbar puncture needle is introduced in the usual manner and about 30 cubic centimeters of cerebrospinal fluid is withdrawn, or a quantity that will reduce the intraspinal pressure to about 30 or 40 millimeters. This is gaged with a three-millimeter glass tube graduated in centimeters and millimeters. When the desired pressure is reached, the connection with the gage is discontinued. The serum-salt mixture having been poured into a large size Luer syringe carrying at the delivery point a

sterile piece of connecting rubber tubing about twelve inches long, this is now attached to the lumbar puncture needle, taking care not to introduce any air; the mixture is then permitted to flow gently into the subdural space. The use of the gate is not essential, the only requisite being that the quantity removed equals the quantity introduced. If the patient complains of discomfort further withdrawal of fluid had best be stopped and the mixture introduced before 30 cubic centimeters have been withdrawn."

This method, however, received a serious shock from the death, at Los Angeles, of seven patients out of eight in the county hospital, to whom "Salvarsan" had been administered. Dr. Whitman, one of the physicians in these cases, gave as the most plausible explanation of the cause of death, that oxidation had taken place in the neosalvarsan. As the drug used was neosalvarsan instead of salvarsan, and the solution, even though in hermetically sealed tubes, was kept for twenty-four hours, it is very probable that oxidation took place during this time. Other investigators then became somewhat wary of the intraspinal injections of salvarsanized serum, and yet the hopelessness of these cases when treated after the ordinary method, or not treated at all, seemed to justify further attempts at medication along similar lines. Questions arose as to the rationality of the treatment. The manner in which the serum was supposed to be effective came to question. Some took no stock whatever in the efficacy of the method, maintaining that the improvement was due to the intravenous injection alone and that the changes in the spinal fluid, which were chiefly in the way of decreased blood count and globulin content, could easily be accounted for by the withdrawal of spinal fluid and dilution of the remaining portion by the serum injected.

As Byrnes of Baltimore says:

"It does not require extensive mathematical knowledge to understand that 12 cubic centimeters of serum, the original amount which Swift and Ellis removed from a patient who has received only 0.6 grams of salvarsan, must contain an infinitesimal amount of either the altered or original arsenical preparation."

This, it seems, is the most forcible argument against the adoption of this form of intraspinal therapy, the subject being admirably treated in a late article by Sach, Strauss, and Kaliski.

From the chemical analyses of Benedict on ten specimens of blood removed from fifteen to forty-five minutes after intravenous injection of salvarsan, this author has made some interesting calculations. Only some .00004 to .0001 gram of metallic arsenic could be de-

tected in 20 cubic centimeters of cold blood and from these figures it was estimated that blood removed three-quarters of an hour after administration of salvarsan contained practically no free arsenic in the serum.

In 1913 Ravaut began the injection intraspinally of unchanged neosalvarsan and a few months later, in November, 1913, Marie and Levaditi did the same sort of work, but with rather disappointing results. In 1914 Ravaut changed his technic by using hypertonic solutions of freshly distilled water for the purpose of doing away with the subsequent unpleasant effects of the injection of the drug. Wile, in the same year, introduced this technic into America and finally gave reports upon fifteen patients thus treated. Two of them are dead, seven markedly improved, both subjectively and in the objective findings in the cerebrospinal fluid; three patients having general paresis were given only a single injection with a relapse of symptoms and no subsequent treatment was given. One patient was markedly improved with regard to the oculomotor palsy, but showed progression of the spinal feature of the disease in a progressive paraplegia. He warns us, however, that for the present at least this form of treatment should be restricted to those cases in which other forms of treatment have proved unavailing and that the danger of the treatment in its present unprotected state should be pointed out to the patient and his family and the responsibility for its administration should be shared by them. Hall in a preliminary paper very recently announces that he has injected intraspinally with neosalvarsan, 125 patients without any untoward results. He does not say with what therapeutic effect however.

It occurred to Byrnes, after about a year's experience with the Swift-Ellis method in its original form, that better results might be secured if a larger dose of some specific drug could be introduced into the subdural space. Wile's injections had consisted of about one to four drops of a 6 per cent. solution of neosalvarsan in distilled water. This makes the solution hypertonic and of such a concentration that every minim contains three milligrams of the drug. Three to twelve milligrams of neosalvarsan, then, constitutes the dose which Wile hit upon as the dose of election in his cases. The spinal canal had been, on various occasions, irrigated with a 1-30000 bichloride solution as a post-operative measure and later Ravaut reported injections of mercurial salts for the treatment of cerebrospinal syphilis. He reported but two cases, the first receiving two

drops of a 1-1000 bichloride solution, with very little or no unpleasant after effects. No subsequent treatment was given and the patient was lost sight of. The second case was treated with mercuric cyanid, two drops of a 1 per cent. solution. Because of its lower coagulating properties and its great activity it was chosen as being perhaps least likely to produce local irritation. The subsequent reaction, however, did not bear this out as there were marked unpleasant symptoms following the injection, among them pains and cramps in the legs, severe muscular contractions beginning in the feet, ascending to the trunk and arms, and involving the entire body, and marked trismus. These symptoms had subsided by the following day and four months later the spinal fluid showed a reduction in the cell content and a negative Wassermann.

Many of the patients which came under Byrnes' care had already received thorough courses of the mercurialized treatment which suggested to him the idea that they might be receiving, along with the salvarsanized serum, a weak solution of the mercurialized serum. He then began a series of experiments upon fifteen patients, dividing them into three groups of five each. The first group received mercurial inunctions; the second daily intramuscular injections of biniodid in oil, and the last group bichloride and potassium iodid by mouth. All were treated to the point of saturation, then blood was withdrawn, the serum separated and analyses were made with a view to learning, if possible, the mercurial content of the serum. Specimens of the spinal fluid were also taken. The result showed that the serum in the patients of the first group, those treated by inunction, showed a slightly higher mercurial content than from those of the other groups. The spinal fluid in only two instances showed what might be considered a questionable trace of mercury, too small to be estimated.

It seemed to him, therefore, absurd to believe that a patient's serum could by this means be impregnated to an extent sufficient to give it any therapeutic value in the treatment of the cerebrospinal form of the disease by intraspinal injections. In his cases he uses the albuminate of mercury, chiefly to avoid the irritating after effects of the injections, and administers it in blood serum. He produces the albuminate by adding the mercurial salt (bichloride) directly to human serum. This precipitates the albuminate of mercury which in an excess of albumin is again readily soluble so that he obtains a perfectly clear solution. Six cubic cen-

timeters will hold in solution at least one-third of a grain of the bichloride converted into the albuminate. All of the requirements seem to be satisfied by this form of the drug. A much larger mercurial content than that desired for therapeutic purposes could be produced. He began with minute doses, arranging them according to body weight, the average tolerance for mercury when administered intramuscularly, and the proportion between the volume of circulating blood and spinal fluid. He found that one-twenty-fifth of a grain of bichloride could be safely administered in this manner. His technic I quote in full. It is the same as that employed by Swift and Ellis with the exception that no drug is administered before bleeding the patient.

1. Sufficient blood is withdrawn to make from 12 to 30 cubic centimeters of serum. The larger amount is obtained if concentrated serum is to be used. After the blood has coagulated the serum is pipetted and if necessary

2. Centrifuged for twenty minutes.

3. If diluted serum is to be used, to 12 cubic centimeters of the centrifuged specimen is added one cubic centimeter of a solution of mercuric chloride in freshly distilled water, so made that each cubic centimeter contains .0013 grams (1/50 grains), of mercuric chloride.

4. To the serum thus prepared is added sufficient quantity of normal salt solution to make a total volume of 30 cubic centimeters. If the concentrated serum is used this step is omitted.

5. It is heated at 56 C. (132 8/10 F.) for a half hour and

6. Administered by gravity at body temperature.

Since the desired amount of mercury is readily soluble in the diluted serum I can see no special reason for employing the concentrated preparation.

In administering the serum I have adopted the method followed by Swift and Ellis. With the patient lying in bed, lumbar puncture is done, pressure readings are made and spinal fluid withdrawn until the pressure falls to 30 millimeters. The serum is then administered and the foot of the bed elevated about eight inches for a half hour."

He reports thirty-two cases, thirteen of which were tabes; two of tabo-paresis; three of cerebro-spinal meningomyelitis and fourteen of general paresis. His cases of tabes and meningomyelitis showed the most marked improvement, although some of the cases of general paresis showed almost as much.

Ordinarily the after effects of the administration are mild. Most patients complain of pain in the legs for six to twelve hours, there may be nausea or even vomiting and a moderate

rise of temperature. These, however, are usually transient and soon subside, usually disappearing by the following day. He has never noticed any evidence of renal disturbance, nor of sphincter disturbances, which have been noticed following the use of salvarsanized serum. The improvements in general, in his cases, are similar and fully equal to those following the injections after the Swift-Ellis method. In cases of tabes marked relief of the pains is noticed, improvement in the gait takes place, and alleviation of gastric symptoms occurs, while in some others no improvement is seen to follow. One case of tabes and one of tabo-paresis showed decidedly marked improvement.

The spinal fluid has always shown a marked decrease in cell count, even more largely in some cases than after the use of salvarsanized serum; the globulin content was diminished but the Wassermann reaction appears to be less readily affected. A negative reaction was obtained in only twelve of the thirty-two cases. He accounts for the low percentage by the fact that the treatments were determined by the cell count and clinical symptoms. These showed improvement, usually, after comparatively few treatments, and so further treatment was not insisted upon. A prolonged course of injections might, he believed, increase the percentage of negative Wassermanns.

It is this technic with very slight variation, which we have used in our own experiments. Our modification has consisted only in minor details. We have not used the manometer to record pressure of cerebrospinal fluid for the reason that Swift and Ellis did not consider it necessary in their procedure, and we have usually depended upon the rapidity of flow of the fluid through the needle point to guide us in our injections. We have, on all occasions, withdrawn at least as large a quantity of spinal fluid as the serum which has been reinjected in its place, except in one or two instances when the patient began to complain of unpleasant subjective symptoms from the withdrawal of the serum. Whenever this has occurred we have immediately stopped and injected the serum at that point, sometimes using a more concentrated mercury content in the serum in order that the dose may be equal to at least one-fiftieth grain of the bichloride.

#### CASE REPORTS.

The following six cases which I shall report came into the service of Dr. Dodge and myself at Mercy Hospital:

CASE 1. C. H. E. Male, age 33 years. Entered hospital December 19, 1914 with marked symptoms of general paresis of an extremely severe type. The patient showed entire loss of mental co-ordination, marked hallucinations and it was necessary to use restraint and to watch him constantly. This patient received one intramuscular injection of neosalvarsan immediately after entrance to hospital, but this produced no seeming effect in his mental condition or in his other symptoms. In fact he became more violent after the injection than before. The blood Wassermann reaction was positive. He was given his first intraspinal injection on December 26. There was no increase in the pressure of the spinal fluid noticed. On the 29th of December he left the hospital and went to his home. Shortly after reaching home his condition, which up to that time had remained about the same, or if there were any change it had been for the worse, began to improve and this improvement was gradual and steady, continuing for a period of about six weeks, by which time the patient could walk around the farm and no restraint was necessary. He began to show mental co-ordination and on the 2nd day of February, of his own accord, returned to the hospital for a second treatment, which was given him. At this time a globulin test was done on the spinal fluid, which showed positive. There was no increase in pressure on this occasion. Following the second injection his improvement continued unabated and he seemed to be perfectly clear and normal mentally. On April 27 he again re-entered the hospital for a third injection. At this time his spinal fluid showed a marked increase in pressure. Forty cubic centimeters were withdrawn instead of 30 as upon each of the other occasions. There was also an increase in the knee jerks noted at this time. After none of the injections were there any severe after affects noted whatsoever. Immediately following the second and third injections the patient left the hospital and returned to his home by train. He is still under observation, is now taking full charge of his farm and apparently well.

CASE 2. E. K. G. Female, age 69. First came under observation for stomach trouble. The stomach examination, after test meal, showed lack of acid, some pus and blood present, otherwise negative. A clear specific history was elicited, including primary and secondary stages. The patient was immediately put upon large doses of K. I. and her stomach symptoms readily cleared up. Treatment by neosalvarsan was given on the 10th day of January. At this time the patient complained also of a girdle sensation, of uncertainty on walking and it was noticed that she showed a slight tabetic gait. She had absence of knee jerk and a positive Argyll-Robertson pupil. She was then given an intraspinal injection of mercuralized serum on the 19th of January, 30 cubic centimeters in amount. The after effects were quite pronounced, the patient complaining of headache, of tremors beginning in the feet, extending up the limbs into the body and arms and finally involving the entire body. She was given an opiate and by the following day all symptoms had subsided. She left the hospital on the day following the injection and shortly after that began to show marked improvement in all symptoms, together with a decided increase in appetite. On

February 11 she was given a second intraspinal injection, 15 cubic centimeters in amount, but of the stronger serum so that the dose was the same. The after effects were still more marked than after the first injection and improvement was slightly slower, but nevertheless gradually for the better. At this time the uncertainty of gait has disappeared almost entirely, a knee jerk can be elicited and also the pupillary reflex to light has returned, although somewhat less than normal. At present she complains of practically no symptoms except an occasional feeling of pressure about the waist. She has an excellent appetite and has increased over twenty pounds in weight. This case is also at present under observation. She has announced her intention of taking a third treatment.

CASE 3. M. C. Male, age over 60. This was a case seen by Dr. Dodge in consultation and was diagnosed as general paresis, showing entire loss of mental co-ordination and of almost as severe a type as that of Case 1 above. In this case a distinct specific history was obtainable. Blood Wassermann was positive. Previous to the present treatment he had had three doses of neosalvarsan administered by intramuscular route. On February 11 he was given an intraspinal injection of mercuralized serum. No increase in pressure of spinal fluid was noted and the after effects following the injection were very slight and transient. Improvement began almost immediately in his mental condition and on March 1 he was given a second injection intraspinally. No increase in pressure was noted at this time, but the after effects of the injection, however, were very marked and lasted several hours, but had practically subsided by the next day. As far as the nervous condition is concerned this patient has shown very marked improvement. At the present time, April 27, he is normal, but has lately sought medical attention for a complicating organic heart trouble. Later, patient died from the heart trouble, his mental condition being clear up to the last.

CASE 4. McM. Age 30. Entered the hospital March 29, 1915 with absent knee jerk, ataxia, Argyll-Robertson pupil and inability to walk in the dark. Diagnosis of tabes was made. History of lues denied. Luetin test negative, Wassermann negative, both in spinal fluid and blood, but globulin positive. Was given first injection March 29 without any previous history of having had treatment with 606 or neosalvarsan. There was no increased pressure in the final fluid. The after effects were not marked following the injection. Patient experienced a decrease in the lancinating pains and girdle sensation shortly after the injection and a slight improvement in his ability to walk and handle himself. April 16 was given second injection. Continued improvement followed this injection as in the previous one. This patient has left the hospital but is still under observation.

CASE 5. H. N. C., age 38. Entered hospital April 19 with symptoms of lateral sclerosis. Specific history was obtained, initial lesion dating back some years previous. The patient was unable to walk without a cane and then only with great difficulty. Exaggerated knee jerks and over-flow of the bladder. Patient was given first injection intraspinally

the day following his entrance. The spinal fluid was clear. Globulin test positive. The injection was followed by very marked reaction, a severe chill followed by a rise of temperature to 104 and pains in the limbs and finally throughout the entire body. These symptoms had subsided by the following day and then improvement began which was steady and gradual up to May 1, when he was given a second intraspinal injection. On this occasion the knee jerks were still exaggerated. Pressure of the intraspinal fluid was quite markedly increased and the cell count showed 60 cells per cubic millimeter. The reaction after this injection was not so marked, in fact was extremely mild. There was no chill, very few pains were complained of, temperature did not rise above 100. On the 4th day of May patient left the hospital with decided improvement in his gait, was able to walk quite readily without the aid of a cane and while on entrance he was unable, when sitting down, to lift his foot to the level of a chair in front of him, just before leaving the hospital he was able to lift either foot, unaided, to the height of the back of an ordinary chair. Knee jerk was still exaggerated and patient will be under observation for some time yet. He says he feels better than any time during the past six years.

CASE 6. B. E. S., female, aged 45. Entered hospital Oct. 4, 1915 with moderately advanced tabes, Argyll-Robertson pupil, absent knee jerk and marked ataxia. Globulin test positive with cell count of 27 per cubic millimeter. Patient had recently been cured of the morphine habit by gradual withdrawal of the drug; formerly she had taken as high as a drachm per day. Chief complaint was pains in the back in region of kidneys running down into legs, with marked girdle sensation. She still suffered some from looseness of the bowels due to the withdrawal of the morphia. She was given the usual dose of a mercurialized serum, 30 cubic centimeters containing 1/50 grain of bichloride. Intraspinal pressure was found much increased on making puncture and 30 cubic centimeters of fluid was withdrawn with little difficulty. Reaction was only moderately severe and was over in about eighteen hours. Pains had disappeared and patient enjoyed the first rest she had had for weeks. She insisted on going home in a buggy, a distance of thirteen miles. This seemingly started her pain again for she returned to the hospital thirty-six hours later, where she was put to bed and treated with sterile hypodermics. Three days later she again went home improved. She will probably have further injections and will be reported upon later.

*A Therapeutic Absurdity.*—Lactopeptine, whether in the form of an elixir, powder or tablets, is a therapeutic absurdity. Even if fresh specimens of the powder, possessing slight tryptic activity, have any advantage over old ones, there is no way of telling which the patient is likely to get, for the trade packages of Lactopeptine are undated. In liquid preparation like Elixir Lactopeptine, pepsin and pancreatin destroy each other (*Jour. A.M.A.*, Oct. 23, 1915, p. 1466).

To Dr. Dodge for allowing me access to his patients, and to Dr. Byrnes, who kindly furnished part of the serum used in this work, I feel greatly indebted.

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*Somnoform.*—This was originally composed of ethyl chloride 60 per cent., methyl chloride 35 per cent. and ethyl bromide 5 per cent. Now it is said to contain but 1 per cent. ethyl bromide. Like ethyl chloride, somnoform has been used as a substitute for nitrous oxide before ether anesthesia and for short operations, but has been mostly used by dentists for extractions. It is doubtful if the mixture has any advantage for ethyl chloride. The mortality is less than that of chloroform, but twice that of ether and four times that of nitrous oxide (*Jour. A.M.A.*, Oct. 16, 1915, p. 1391).

**The Journal**  
 OF THE  
**Michigan State Medical Society**  
 ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

Arthur M. Hume, Chairman .....	Owosso.
A. P. Biddle .....	Detroit.
W. J. Kay .....	Lapeer.
W. J. DuBois .....	Grand Rapids.

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All communications relative to exchanges, books for review, manuscripts, news, advertising, and subscriptions are to be addressed to Frederick C. Warnshuis, M. D., 91 Monroe Ave., Grand Rapids, Mich.

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December

***Editorials***

**GREETINGS.**

The Publication Committee and the Editor of the *Journal* extend to the members, readers and advertisers their most cordial wishes and greetings for a Merry Christmas and a Happy New Year. May the season of holiday festivities bequeath to all of you a period of unalloyed pleasure and happiness.

In casting about for an appropriate thought to submit for your meditation, our attention was arrested by the following paragraph from one of Osler's addresses:

"Banish the future: live only for the hour and its allotted work. Think not of the amount to be accomplished, the difficulties to be overcome, or the end to be obtained, but set earnestly at the little task at your elbow, letting that be sufficient for the day: for surely our plain duty is 'not to see what lies dimly at a distance, but to do what lies clearly at hand.'"

**INDUSTRIAL SURGERY.**

The compensation laws now in force in several states may be accepted as the employers' recognition of the responsibility they assume for the economic and physical welfare of their employees. These compensation laws, providing as they do for the care and monetary remuneration of injured workmen or their legal

heirs, have created a new field of surgical procedure that is of interest to every member of the profession. They have created a new specialty that has to do with the prevention as well as the treatment of industrial diseases and injuries. Employers have assigned to surgeons the problem of devising methods whereby the employee may be safe-guarded. They also expect that when injuries are sustained—the law of averages and man's fallibility create a definite percentage—that then the injured employee shall be the recipient of such treatment as will best insure a prompt and speedy recovery with end results that produce the least deformity and the greatest degree of functional usefulness of the injured part or member.

Large business industries have their own chief surgeon to whom is intrusted the work of preventing accidents, devising a system of first aid and the care of those who are injured. Firms of lesser financial rating and unable to pay for the services of a chief surgeon are combining and pooling their interests to employ a surgeon to attend the employees of the members of the pool. Insurance companies are in the habit of retaining the services of a single surgeon to serve their policy holders.

Thus has there been caused to develop a new branch of surgery which some have been pleased to designate as Industrial Surgery. An efficient system of practice has evolved and to it there is rapidly being added new pronouncements of fundamental principles. The literature upon the subject is becoming more voluminous and available. Conferences are being held and the problems presented are being overcome as the collective experiences of surgeons recount the results of their methods.

It was but a few years ago when accident surgery, barring fractures and dislocations, was given but little thought and discussion. The accidents and injuries that presented in the industrial world were likewise given but little thought or discussion. They were accepted as but natural consequences of given conditions. Their end results were looked upon as unpreventable conditions and as a matter of course. Occurring, the easiest available doctor was summoned. In the end the ultimate result was largely dependent upon the doctor who assumed charge of the case.

Efficiency experts, employed to devise methods for doing business at a reduced production cost, soon observed that when an injured employee was attended by a certain doctor the final result of the injury was less incapacitating, the

recovery occurred more promptly and claims for damages were less. On the other hand when there was a promiscuous selection of doctors greater untoward results were encountered. This experience is what created the office of company surgeons.

The members of the profession whose foresight was keen, seized the opportunities thus presented. They rendered such aid and attention as to cause their being recognized and today many of them hold envied positions and receive handsome yearly incomes.

The surgery performed and the surgical treatment administered by these surgeons was formerly covered in a few chapters in the surgical text-books under the subdivision of minor surgery. That classification has today become inadequate and obsolete. The subject has been developed so that it has become classified anew as a separate specialty and the recognized principles of treatment if outlined would cause to be evolved a text book equal in size and value to those now in existence in certain other special branches of surgery.

To become proficient in industrial surgery requires a thorough knowledge of anatomy and the principles of general surgery. To this there must be added acquired skill and judgment that is daily enhanced by actual experience. It is as vital to prevent infection in the treatment of a simple, minor wound as it is to prevent infection following a major operation. The treatment of burns, fractures, saving of members, repair of severed tendons are equally as important and call forth the use of as much skill as does an oophorectomy, appendectomy and cholecystotomy. To know when to administer antitetanic serum and when not to incur such expense is equal to the knowledge required for the administration of serum in major serological indications.

One might continue to enumerate and compare analogous conditions. It is not our purpose to advance a reason or plead for a recognition of industrial surgery. We desire to merely outline the requirements and training requisite for one desirous of successfully engaging in this newer field of surgery. The work is one of growing importance and is rapidly becoming more exacting. Many desirable openings remain unfilled and but await him who perfects himself to perform the duties of an industrial surgeon.

To physicians in smaller communities and along railroad connecting points there is afforded opportunity of securing remunerative

appointments even though they may not attain chief surgeonship berths. Chief railway surgeons are breaking away from the rule of appointing as surgeon the oldest established physician in the community where it is deemed desirable to have a local surgeon. They are selecting men who, regardless of age, administer treatment and surgical care in accord with the principles of industrial surgery.

### *Editorial Comments*

Acting upon instructions received from the Publication Committee no reprints will be furnished to authors who do not send their remittances to cover the reprint cost with their order. This ruling is made necessary by reason of the fact that in the past we have had to charge off reprint bills receivable on account of inability to collect. This new rule will be rigidly observed in the future. If you order reprints and fail to enclose a remittance to cover you will know the reason for failing to receive your reprints.

The Sixth Clinical Congress of Surgery was on the whole very successfully conducted in Boston during the week of October 25th. Abundance of clinical material was available, instructively classified and demonstrated. There was one manifest criticism and that was that with one or two exceptions the operator's demonstrations and technic was hidden from the observer's view by reason of the large number of assistants. The surgeons conducting operations during the sessions of the Congress should have it firmly impressed upon them the desirability of but one or two assistants—in certain operating rooms we counted five and six assistants. With such a large operative team it is impossible for the spectator to witness very much of the operative work. The elimination of this objection should receive the attention of those in charge of the next clinical congress.

The evening sessions might also be attended with renewed interest were others than Murphy, Crile, Oschner, et al, selected to occupy the important places upon the program. Certainly there are others devoid of "Lime-light cravings" who are able to present valuable papers and discussions for the mental entertainment of the assembled audience.

County secretaries are kindly requested to

promptly supply us with the names of newly elected officers. The receipts for dues will be mailed as promptly as it is possible to enter them on our records and fill in the membership certificates.

In the October issue we solicited expressions of opinions as to what time next fall or summer it would be most desirable to hold our annual meeting in Houghton. Thus far we have received but one reply. The Council, empowered to set the date, holds its meeting early in January. This body is desirous of securing the wishes of the members and to that end we are again soliciting an expression from our entire membership.

According to Cabot, pallor as a rule is not due to anemia. Pale people are common: anemia is rare. Discussing the subject he continues: The majority of cases of non-anemic pallor are due to living indoors, to continuous exposure to high temperatures, as in industry or in the tropics or to congenital causes.

Tuberculosis patients are usually pale but seldom anemic. Even extreme and ghastly pallor in consumption may be accompanied by a normal blood. Pallor of the lips is more significant than pallor of the face, much more apt to mean anemia, yet even this site is by no means proof of anemia. Anyone who is in the habit of basing his judgment upon the looks of the skin and mucous membrane has violent surprises awaiting him.

The spitting of pure blood in any considerable quantity is indicative of pulmonary tuberculosis in the great majority of cases irrespective of the presence or absence of other symptoms.

In a review of 3416 cases of hemoptysis Cabot has tabulated the following causes: Tuberculosis 1723; mitral disease 1177; unspecified 183; pulmonary thrombosis or embolism 141; pulmonary abscess or gangrene 77; bronchiectasis 58; pneumonia 52; aneurysm 22; trauma 17; neoplasm 6. In determining the diagnosis of hemoptysis it is essential to differentiate between blood-streaked sputum which may occur from other causes than tuberculosis.

The opinion is often expressed after the occurrence of hemoptysis in a given patient that it is of non-tuberculosis origin because it is impossible to demonstrate the physical signs of tuberculosis as being present in the lungs. It is

frequently too early to detect these lung findings and if the case is neglected tuberculosis will show itself in a few months in unmistakable form. This should be obviated by immediately placing the patient who has had a hemoptysis under prompt treatment for tuberculosis.

### Correspondence

October 20, 1915.

Dr. F. C. Warnshuis,  
Grand Rapids, Mich.

My Dear Doctor Warnshuis:

I desire to call your attention to the following paragraph from the report of the Committee on Venereal Prophylaxis, which was made at the fiftieth annual meeting of the Michigan State Medical Society and printed in the *Journal of the Michigan State Medical Society*, Vol. XIV, No. 10, October, 1915, page 535:

"Today there is but one public hospital to which the syphilitic as such can gain admittance and be treated during the dangerous time of his infection. All our other institutions close their doors to the syphilitic. A syphilitic who happened to contract typhoid fever or pneumonia would be readily admitted to any hospital, so long as his syphilis remained in ignorance. Many such syphilites gain entrance into our hospital by reason of failure of diagnosis, and when perchance the diagnosis has been reached, the poor patient is shown the door with the greatest possible expedition.

We beg to submit to you that the Judge of the Probate Court of the city of Detroit, is forced to send his syphilitic charges to the University at Ann Arbor, because no Hospital in the city of Detroit will accept them, and these conditions exist in other cities as well. We can do no more as your committee than to invite your attention to this deplorable and narrow minded policy; a condition which we as ministers of the public health must take active measures to remedy immediately."

These statements were considered by the Executive Board of the Detroit College of Medicine and Surgery, at their meeting October 8, 1915.

The Executive Board passed a resolution that a communication should be sent to you, correcting these statements and asking you to make a public announcement in your *Journal* to the effect that Harper Hospital is taking syphilitic cases and has been doing so for a long time and also that Herman Kiefer Hospital has made the necessary arrangements and will take these cases from the first of November on.

Very truly yours,  
JOSEPH H. HATHAWAY, Secretary.

Chicago, Nov. 12, 1915.

Dr. Frederick C. Warnshuis, Editor,  
*Michigan State Journal*, Grand Rapids, Mich.

Dear Sir:

I shall soon notify your representative here, the Co-operative Advertising Bureau, to send you advertising from the Chicago Laboratory.

Let me say I have selected your *Journal*, among others, because of its scientific articles, good editorials on live subjects, interesting book reviews, correspondence, make up, etc.

There are some state journals I will not use under any circumstances, for the simple reason that they offer little to their readers, being mere collections of papers and perfunctory items published pretty much in the order received, without regard to value.

Some one has said that business goes where it is invited and remains only while well treated. May I expect the Editor's co-operation?

If we can make our advertising matter so interesting that it deserves comment, let us have it! Show the advertiser that his copy is not a billboard at which your readers may glance, but an essential part of your *Journal*, subject to praise or criticism, as the case may be.

With best wishes, I am  
Very truly yours,

E. J. DOERING,  
Medical Advertising.

79 E. Adams St., Chicago.

### Deaths

**Dr. H. L. Foster**, Reed City, Michigan, born Dec. 15, 1857, died Nov. 7, 1915.

Dr. Foster graduated from the N. Y. Homeopathic Medical College and Hospital in 1881 and located at Reed City soon thereafter. In 1897 he was married to Miss Anna Stoddard of Reed City and she and a daughter, Miss Helen, survive him. His death occurred suddenly on the evening of Nov. 7, while returning from a professional call at Ashton. It happened that Mrs. Foster had accompanied him and without warning he fell over against her dead. The car he was driving stopped at once as his pressure on the exhilerator relaxed and Mrs. Foster found herself in a most distressing situation. After waiting vainly for someone to come along she finally was obliged to walk back several miles to Orono, where she telephoned Reed City for assistance.

The doctor had never had a serious illness except a severe attack of blood-poisoning several years ago, which undermined his strength and doubtless was the primary cause of the heart dilatation from which he died. He had been a most prominent member of Reed City society for thirty-four years; had served in various

official capacities, including that of Mayor of the city and numbered warm friends by the hundreds. Several of his friends told the writer that no other citizen there, if taken away, would be so sincerely mourned by so many people as would the doctor. He was a member of the Masonic order and of the Elks. In Masonry he belonged to all of the orders and he was buried under the auspices of Pilgrim Commandry K. T. of Big Rapids on Nov. 10, 1915. He was a charter member of the Osceola-Lake Medical Society and several times acted as its President. He also belonged to the Michigan State Medical Society and the American Medical Association.

Dr. Foster was one of the most intimate friends possessed by the writer in the Medical Profession, for a period of nearly twenty-five years, and it is a pleasure to testify concerning the many excellent qualities possessed by him. In professional circles he was always honorable and above board with his associates and did much to maintain the relations of cordiality and good fellowship that have existed in the ranks of the profession in his town. He was a typical old time family physician, with the welfare of the patients as his first thought. He was most modest in his pretensions and never cultivated the art of public speaking, but no one more successfully held the confidence and affection of those with whom he became intimately acquainted. He possessed to the fullest extent the elements of character that make good fellowship and those whom he honored with the full measure of his confidence will for long mourn his loss. For many years he was local surgeon for the G. R. & I. and the P. M. Railroad Companies, and his last professional work was to care for a lad injured upon the G. R. & I. road.

W. T. DODGE.

**Dr. Henry Johnson**, of Caseville, Mich., died Oct. 17, 1915 after an illness of nearly four years. Dr. Johnson graduated from University of Michigan in the early Sixty's. Served as Surgeon in the 6th Mich. Cavalry being mustered out with rank of Major. After the close of the war Dr. Johnson practiced in various places, coming to Caseville in 1875, where he led an active life until about four years ago. He was formerly a Fellow of the American Medical Association and a member of its component parts. He was an honorary member of the Huron County Medical Society and the oldest practitioner of the county.

**Julius A. Post**, one of Lansing's oldest doctors dropped dead Oct. 29 in Lansing while standing on the street corner waiting for a car. He was 68 years old and for the past thirty years had been a very popular physician in that city.

**Dr. George E. Ranney**, of Lansing, died on Nov. 10. Death resulted from a stroke of apoplexy. He resided in Lansing since 1866 and was a very prominent physician in that city.

**Dr. Wayne Smith**, of Detroit, died on Nov. 13 from a stroke of apoplexy. He was the Superintendent of Harper Hospital since the fall of 1913. He was 38 years old.

### State News Notes

A series of lectures, plans for which were fathered by about thirty Detroit manufacturers, will be given this coming winter to give residents of the city opportunity to learn how to drive away humanity's ills. The lectures will be given under the auspices of the Detroit College of Medicine and Surgery and some of them will be illustrated.

There are twenty-four lectures listed and the subjects and the speakers are as follows:

"How to Keep Well," Dr. Guy L. Kiefer, former health officer; "Marriage Rites and Infant Care Among Ancient Romans," Dr. W. P. Manton; "Digestion and Efficiency," Dr. L. J. Hirschman; "The Physiology of Circulation," Professor W. H. Koch; "Practical Household Chemistry," Professor C. A. Doty; "The Prevention of Deformities," Dr. Daniel Laferte; "The Gas Bacillus," Dr. Angus McLean; "Some Plain Facts About the X-ray," Dr. Preston M. Hickey; "Microbes," Dr. P. F. Morse; "On the Detroit Water Supply From an Optimistic Standpoint," Dr. John E. Clark, county chemist; "The Teaching of Sex Hygiene," Dr. A. P. Biddle; "Sex Problems," Dr. F. W. Robbins; "The Child and the Home," Dr. Raymond Hoobler; "The Growth of Our Nervous System and How to Train It," Dr. Augustus Ives; "Cancer," Dr. J. Henry Carstens; "The Causes and Prevention of Diseases of the Heart," Dr. Charles G. Jennings; "Common Toadstool's. Their Use and Abuse," Dr. W. H. MacCracken; "Talking, Hearing and Smelling; Their Care and Treatment," Dr. B. R. Shurly; "Mouth Hygiene as a Factor in Sickness and Health," Dr. Charles H. Oakman; "Economic Relations of the Eye and Every-Day Life," Dr. Don M. Campbell; "The Human Power Plant," Dr. Joseph H. Hathaway; "The Citizen and the Public Health," Dr. W. H. Price; "Tuberculosis," Dr. V. C. Vaughan, Jr.; "Disease; the Manner of Its Transmission," Dr. C. Hollister Judd.

The plan is to give the lectures in different parts of the city, and not have any of them duplicated in a stated section. Several churches and social clubs have asked for programs.

The following Committee on Arrangements for the next meeting of the American Medical Association, to be held in Detroit, June 12-16, 1916, has been appointed:

Chairman—Dr. L. J. Hirschman.  
Treasurer—Dr. Thaddeus Walker.  
Secretary—Dr. Ernest K. Cullen.

Sub-Committees—

Dr. E. W. Haass, Finance.  
Dr. A. D. Holmes, Entertainment.  
Dr. Frank B. Walker, Registration.  
Dr. Jas. H. Dempster, Printing and Publication.  
Dr. Frank B. Tibbals, Halls and Meeting Places.  
Dr. J. W. Vaughan, Scientific Exhibits.  
Dr. J. N. Bell, Commercial Exhibits.  
Dr. Rolland Parmeter, Hotels.  
Dr. Angus McLean, Automobiles.

The Chicago physician's bid for publicity in connection with his assumed attitude of permitting a deformed infant to die without the performance of a surgical operation is the rankest, rawest and most distasteful perpetration ever attempted by a medical man. If he is perchance affiliated with the Chicago Medical Society we trust his membership will be speedily revoked. Such bids for notoriety demand nought but severest criticism.

Dr. Wm. J. Mayo, of Rochester, Minn., will appear before the Kent County Medical Society on the evening of December 6 and before the Calhoun County Society on the evening of December 7. The Kent County Society will tender a dinner to Dr. Mayo at the Pantlind Hotel at 6 p. m. The profession in the vicinity of these two societies are cordially invited to come and hear Dr. Mayo.

Superintendent J. B. Draper of the University Hospital at Ann Arbor was instantly killed by being run over by a street car on the evening of November 13th.

Dr. F. J. Smith, formerly resident physician at Johns Hopkins Hospital has accepted the appointment of resident physician at the Ford Hospital at Detroit.

The next meeting of the Clinical Congress of Surgeons of North America will be held in Philadelphia in the fall of 1916.

The \$47,000 bequeathed to the city of Ypsilanti by the late A. Beyer is now available for the erection of a city hospital.

Dr. T. C. Buskirk of Portland has moved to Lake Odessa.

Dr. Rigterink of Zeeland has located in Kalamazoo.

Dr. Joe J. De Pree, graduate in this year's Class of the University, has located in Zeeland.

Dr. F. J. Larned, limiting his practice to diseases of children, has located in Grand Rapids.

Dr. F. W. Ilgenfritz of Kalamazoo has been re-elected county physician.

Dr. John B. Blum of Charlotte and Miss Mary K. Holt of El Paso, Texas were married October 20.

Dr. Hugh C. Graham of Barryton and Miss Nina M. Gamble were married on October 10.

Dr. H. C. Miller of Hillsdale was re-elected County Physician.

Dr. B. H. McMullen was elected Mayor of Cadillac on Nov. 2.

### County Society News

#### CALHOUN COUNTY

Program—Nov. 12, 1915.

“Hysteria—Its Etiology, Diagnosis and Treatment.”

Dr. W. E. Newark, Charlotte, Mich.

Discussion by Drs. E. M. Chauncey, E. C. Derickson.

“Malignant Ovarian Paratoma With Premature Puberty and Precocious Physical Development.”

Dr. R. H. Harris.

Discussion by Drs. Thomas Zelinsky, Bertha Mosher.

“The Role of the Anesthetist.”

Dr. R. G. Leland, Kalamazoo.

Discussion by Drs. W. M. Putman, J. A. Elliott.

#### INFANT FEEDING.

Abstract from Article by Dr. W. H. Haughey.

When we remember that during intra-uterine life nutrition is by means of the mother's blood stream; that the fetus assimilates what it needs of the elaborated particles prepared in the mother's digestive system, we will see more clearly that during fetal life the digestive system, is undergoing a process of growth, when of course it cannot and does not functionate.

An interval of time is required for the functions of the digestive system and its associated organs and glands to become established. At birth there is no contractile, no peristaltic action in the stomach, no motive power.

It is probable that a selective process on the part of nature enables the blood stream of the mother to supply, and the fetus to appropriate, those particles required for its particular development.

Proteins are the energy producing, life giving, vitalizing elements of food. Minerals are organically combined with proteins in constant and unvarying proportions. Together they are the elements of growth.

Facts show that every healthy mother can nurse her baby, and her milk will agree.

#### Colic.

When from one cause or another, as necessary handling, clothing, heat, etc., a child is restless, all agree it has colic, hot water is given, and the child refuses to nurse. When nursing, a child may stop to rest fatigued muscles, and fall asleep. It soon becomes restless from hunger, colic is suspected, and more hot water is given. Again the child refuses to nurse. As long as a child can get hot water it will not nurse satisfactorily. Water prevents vigorous nursing. Vigorous nursing is required to stimulate secretion.

#### Artificial Feeding.

Artificial feeding should only be resorted to in cases of absolute necessity, as when the mother dies or is not healthy. When from absolute necessity some artificial food must be supplied it should be clean milk, modified to closely resemble mother's milk by some of the well known methods.

#### CLINTON COUNTY

At the annual meeting of the Clinton County Medical Society held at Steel Hotel, St. Johns, twenty-five Clinton county doctors were present. The applications of five doctors, C. T. Foo, C. R. Keller, A. M. Wheeler, A. M. Switzer, and A. T. Parrish were received with dues for 1916 and they were duly elected members making Clinton county twenty-seven Society members out of thirty-one eligible doctors in the county.

Dr. M. S. Gregory of Eureka was elected President.

Dr. James McGillcuddy of Ovid was elected Vice-President.

Dr. Eugene Hart of St. Johns was elected Secretary and Treasurer.

Dr. O. A. Hart of St. Johns was elected Delegate.

Dr. M. Weller of St. Johns was elected Alternate.

Meeting then adjourned to dining room where a banquet was served after which Dr. F. B. Walker of Detroit read a paper on “Acute Abdominal Conditions.” Dr. Mathews of Detroit opened the discussion after which nearly all of the members joined in the discussion of the paper. After a few short speeches by Drs. Gale, Too, A. O. Hart, Gregory, Squair and others the meeting adjourned to meet again first Thursday evening in November.

EUGENE HART, Secretary.

#### GRAND TRAVERSE-LEELANAU COUNTY

The annual meeting of the Grand Traverse-Leelanau County Medical Society was held on Tuesday evening, November 2, at the office of Dr. E. B. Minor.

The meeting was called to order by the President, Dr. J. F. Slepicka.

The following officers were elected for the ensuing year:

President—Dr. J. B. Martin, Traverse City.

Vice-President—Dr. H. Thurtell, Traverse City.

Secretary-Treasurer—Dr. W. D. Mueller, Traverse City.

Member Medico Legal Committee—Dr. G. W. Fralick, Maple City.

W. D. MUELLER, Secretary.

### INGHAM COUNTY

The annual meeting of the Ingham County Medical Society was held at the Downey House, Lansing on Nov. 11 with President B. M. Davey in the chair.

A report of the Secretary-Treasurer, Dr. L. C. Towne showed the Society to be in excellent shape financially. Three of our members, Drs. Julius Post, Geo. E. Ranney and J. F. Campbell have died during the last year and in their death our local Society and in part the whole profession has suffered a great loss. They were among the oldest in years of service permanently identified with the County and State Society. A committee composed of Drs. H. S. Bartholomew, L. W. Toles, and J. E. McIntyre was appointed to draw up suitable solutions.

The following officers were elected for the ensuing year.

President—Dr. G. F. Bauch.

Vice-President—Dr. F. A. Jones.

Secretary-Treasurer—Dr. Karl Brucker.

Member of Medico Legal Commission—Dr. M. L. Holm.

Delegate to State Meeting—Dr. B. M. Davey.

Alternate to State Meeting—Dr. B. D. Niles.

Member of Milk Commission—Dr. F. J. Drolett.

The retiring President, Dr. B. M. Davey gave an interesting address in which he reviewed many of the recent developments in Medicine and Surgery and anticipates great things for the future.

The meeting was followed by a banquet in the Downey Grille at which the members and their ladies were the guests of Dr. and Mrs. B. M. Davey.

KARL B. BRUCKER, Secretary.

### KALAMAZOO ACADEMY OF MEDICINE

The Kalamazoo Academy of Medicine has held meetings regularly on September 28, October 12 and 26, November 12 and 23 respectively. The abstracts here appended were obtained from papers presented at these meetings.

The annual meeting of the Kalamazoo Academy will occur on December 14, 1915 and Dr. John Hurty of Indianapolis will be our guest and essayist.

C. B. FULKERSON, Secretary.

October 26, 1915.

Abstract of Paper on "The Remote Effects of Inherited Syphilis."

Dr. Wesley Taylor.

One of the obstacles in the way of establishing such a relationship between a hereditary disease and the infection in the parent, was a misinterpretation of the laws of heredity. It has always been held that acquired characteristics cannot be transmitted. While this is true, the error lay in assuming that the leutic taint being an acquired disease, should act

as an acquired characteristic. In cases of active syphilis in both parents both germinal cells may be affected. If so they are weakened and fundamentally altered before conception occurs, hence the organism is basically affected, and the leutic taint becomes truly hereditary, and the blight is transmitted, to successive generations.

Though it is unusual, a large family of healthy children is no contraindication of past lues. I have in mind two families. One has six supposedly healthy children and numerous grandchildren in spite of the fact that the head of the family recently reacted positively to the Wassermann test, after which he admitted a primary lesion in his youth. In the other family the grandmother developed tabes—though all her four children are alive and well. Of their grandchildren, however, one has a rudimentary thumb and another has a double urethral meatus.

About ten years ago I had the opportunity of seeing a clinic on "Cured Cases of Lues," conducted by the celebrated Prof. Fournier at the St. Louis Hospital, Paris. He showed about fifty cases of syphilis which he had treated from beginning to end, over a period of two full years, and which he had kept under observation for a number of years following. These patients were, as I remember, all men who had married and were raising families. He not only showed these cases but showed some of the children in each case, making it the largest clinic I ever witnessed. In no case was there any sign or symptom of remaining infection in the patient. Nor had the wife suffered miscarriage or lost any of her children through leutic taint. Neither did any child show any symptoms whatever of hereditary lues. This was before the Wassermann test was known and before Schaudin demonstrated the spirochaeta pallida as the organism in syphilis.

It has been remarked many times that the descendants of leutic parents are especially susceptible to tuberculosis in all its forms, and they have so very little resistance that if they do not fall victims to other diseases they are very liable to extermination finally from consumption. Many families have been literally wiped out through this combination of diseases. It might be mentioned here that until recently most of the conservative Insurance Companies refused to accept as risks for insurance, persons who had previously had syphilis, unless they had taken two full years of continuous treatment, and had been free from any symptoms for at least one year following such treatment. If then the blood reacted negatively to a Wassermann test they might be accepted. Even with such restrictions the average mortality rate was 188 as compared with a normal death rate of 100. Today a number of leading companies refuse to take any one who has ever had syphilis—regardless of previous treatment or Wassermann test.

Fournier collected 46 cases of marriage of congenital leutics. Of 145 pregnancies forty-three aborted, thirty-nine were either still born or died soon after birth. Among the remaining sixty-three living children, all kinds of troubles appeared. Eye defects, brain tumors, rachitis, general retardation of physical development, infantilism, mental and idiotic dystrophies, epilepsy, hysteria, convulsions, heart neoplasms, closure of the urethra, anomalies of fingers and toes, atrophy of the tongue, congenital

amputation of extremities and neoplasms of palate, ears and tongue occurred among other things. All of these impairments even in the third generation were not accidental. They had a basis for their existence more potent than mere chance. If we find hereditary syphilis as a rule at the base of such eye trouble as optic atrophy, intestinal and parenchymatous keratitis, ptosis, ocular palsies and strabismus, Argyll-Robertson pupil, eczema tarsi, midriasis and unequal and irregular pupils, does it not seem reasonable that a comparable list of disorders of other organs might likewise be laid to hereditary lues?

The spirochaeta are probably not present in many of the more tardy manifestations of hereditary lues. Certainly they are no longer active in most of these troubles. At any rate it seems that the syphilitic infection has changed the germ plasm-cast in new traits and destroyed old ones—and changed the mold as it were. The old vigor and robustness exist no longer—the organism has degenerated. Unless an infusion of fresh new blood be brought in it is doomed to extinction. As the Bible says "The sins of the father are handed down unto the third and fourth generations." Whether or not it be handed farther or how much farther is a problem which will probably take some time yet to determine.

September 28, 1915.

Abstract of Paper on Treatment of Puerperal Infection.

Dr. Mark T. Goldstine, L.M., Chicago, Ill.

We know that puerperal sepsis is a wound infection and is due to the carrying in of micro-organisms by the doctor, nurse and sometimes the husband of the patient or the patient herself by taking douches immediately before the onset of labor. Consequently vaginal examinations should be restricted as much as possible. From the investigation of Kronig, Leopold, Williams and from many of my own observations am convinced that the normal vaginal secretions are sterile.

The treatment as carried out now in the gynecological service at Wesley Memorial Hospital is as follows, with, of course, such special measures as a few of the cases would require. At present the fundamental principle in the cure of the above disease is the establishing of an immunity within the patient to the infection by building up the patient's physiological resistance to a point when it conquers the infections.

These patients should be under the best possible hygienic surroundings and in view of this fact, we prefer the hospital to any other place. As soon as the patient enters the hospital she is given a bed where air and sunlight can be had in plenty, and the following is the routine treatment that is given.

1. The head of the bed is raised to comfortable degree. This favors drainage.

2. An ice bag is placed on the abdomen in all cases and one on the head if the temperature is fairly high. They relieve pain to a marked degree, quiet the patient, and reduce temperature to some extent.

3. A large amount of nutritions and easily digested food is given as quickly as the stomach will tolerate it.

4. Liquids are forced on the patient and at least two quarts must be taken daily, and as much more as the patient desires. This helps elimination and keeps up the patient's strength. Salines are given as the case requires but not continuous, as it disturbs the patient too much and good results are obtained by giving an amount which will be retained at periods from three to six hours apart.

5. The patients are taken outdoors when possible and sun baths are given frequently.

6. Blood, urine, etc. are analyzed.

7. Pain is relieved from six to eight hours so sleep is obtained daily.

The uterus and vaginal canal are not disturbed unless there is considerable bleeding. Should parts of the fetus, placenta, or ovum be retained there is no necessity of their removal as a septic uterus will in good time empty itself much to the patient's and attending physician's advantage. This I have proven clinically time and time again. Removal of debris cannot be accomplished without more or less traumatism. In this way new avenues for the entrance of infection are opened and, in a great many instances a mild mixed infection is turned into a very virulent infection and a virulent infection is greatly increased. Granting that the streptococcus is the worst form of infection and should be left alone because the patients have a better chance of recovery under that regime of treatment, then why should we curette, douche, etc. the milder infection? What is good treatment for the worst cases is surely good for the milder ones; and furthermore there are some streptococci in most every lochia examined. We will come to this a little later in our case reports.

DISCUSSION OF DR. GOLDSTINE'S PAPER.

Dr. Boys emphasized the fact that men doing obstetrics should be properly equipped in order to conduct properly obstetrical work.

Husbands should not sleep with patient after delivery.

It is important to examine after every operative delivery the whole vaginal tract in order to insure prophylaxis. Sepsis has developed before the physician has seen his patient in abortive cases and there is usually something in the uterus.

Dr. Stewart said that the old practitioner was often prosecuted for leaving placenta behind after delivery.

Dr. Scholten had cases that had done well when left alone and had become worse when interfered with.

Dr. De Witt emphasized prophylaxis. Position of parturient patient is of great importance. The dorsal position very bad one. He prefers the lateral position.

Puerperal sepsis is a lymphangitis. Sapremia results from a mass of putrefactive material in the uterus.

Dr. Jackson thought that when ergot is used all foreign bodies in the uterus should be removed so uterus could contract.

### An Acute Metastatic Infectious Osteomyelitis and Arthritis.

Dr. John B. Murphy, Chicago, Ill.

Streptococcus viridans is a very virulent organism and is a factor in a great many cases of osteomyelitis. Dr. Murphy spoke briefly about the work of Dr. Rosenow of Chicago. Dr. Rosenow is the first worker in medicine to be able to change the morphology and pathogenicity of an organism through culture methods on different media. For example, from a single drop of a virulent culture of streptococcus viridans six cultures were made on as many different media. By growing these for many generations Dr. Rosenow produced displococcus lanceolatis which produces osteomyelitis and from another infectious arthritis, etc., etc. The transmutation of any organism had never been successfully performed before.

Definite infections elect specific tissues for destruction.

Tubercle bacilli select the knee or hip joint, then tendon sheaths. Why one joint?

Acute metastatic infectious osteomyelitis predominates in spring or fall. It manifests itself usually in eleven to fifteen days following an acute rhinitis or pharyngitis. Acute metastatic infectious osteomyelitis manifests itself in typhoid cases about the fifth or sixth week of the disease. Symptomatically it manifests itself by chill, fever and pain in limb. It is often very difficult to differentiate acute metastatic infectious osteomyelitis. During the first twenty-four hours there is no swelling but superficial tenderness of the joints in acute infectious arthritis but in acute metastatic infectious osteomyelitis swelling of joint does not occur and pain is elicited only by deep pressure for thirty second or more just a short distance from the joint just beyond the epiphysis. Remember that the infectious focus occurs in one of the nutrient vessels within the bone. Edema develops in the periosteum over the site of the lesion. It is only by deep pressure that pain is elicited. If the condition continues unabated the bone is destroyed, pust undermines the periosteum and spreads up and down the bone. The toxemia becomes very severe. In osteomyelitis pus does not develop between the epiphysis and joint, but tuberculosis seeks this area for destruction before entering the joint. In osteomyelitis the pus enters the joints by undermining the periosteum and then the perichondrium. In such advanced states the bone is destroyed and a stiff joint results. Only forty-eight or sixty hours are required to destroy the entire bone thus diseased.

When a diagnosis of acute metastatic infectious osteomyelitis has been made during the first twenty-four or thirty-six hours this is the time to act. Destruction of bone is from pressure of the pus. Destruction of the soft tissues of the fore arm from metastatic infection from a terminal phalanx is due to pressure. Pressure cause ischemia. The same process is at work in the bone. The infected focus must be evacuated. With knife and chisel or gimblet, first the soft tissue and the periosteum are divided. When one approaches the periosteum he will observe a white edema present. After one has removed the bone and entered the infected focus, pus will not rush forth with the same force that it will from

a pus pocket in soft tissues. But if one waits for a short period a small amount of pus will run from the infected bone. The old idea that the greater the amount of pus the greater the skill of the operator is no longer in evidence. Now our problem is to prevent the development of pus—how little pus do we get. We do not discuss the treatment of peritonitis any more in treatment of appendicitis but how to prevent peritonitis and development of pus.

If the acute metastatic infectious osteomyelitis progresses to the pronounced destruction of bone the pus must be evacuated, the limb mobilized, the sequesterum allowed to form and be removed and then bone transplantation or implantation is performed to stimulate osteogenesis. Dr. Murphy discussed to some degree the experimental and theoretical side of the source of the transplant whether it should be taken from animals or same species or from same person but it is now a recognized fact that osteogenesis is more greatly stimulated when the transplant is taken from same individual.

Dr. Murphy showed several lantern slides of the various steps in the development of a focus and acute metastatic infectious osteomyelitis and cases that had been successfully treated.

Acute metastatic infectious arthritis may develop from infection in upper respiratory tract. Symptoms are chill, fever and pain in infected joint. Edema or swelling after the first thirty-six or forty-eight hours, and superficial tenderness. The infection is not arrested within the joint cavity but in the synovial membrane outside of the endothelial layer. The fluid in the joint is made up of poly-nuclear leucocytes and lymphocytes. There are no micro-organisms. When fluid is withdrawn micro-organisms seldom ever enter joint. Fluid is a protection at one time called laudable pus. Remove fluid and lessen pressure and ischemia and prevent destruction of tissue. Incise capsule, remove fluid, instill formalin and glycerine then sew up. In another week incise and repeat process if necessary but do not use the old methods of drainage tubes inserted into synovial sac. These cause adhesions and ankylosis. Replace fluid withdrawn by some antiseptic that will make poor culture media for micro-organism. One can aspirate sac if desirable and inject an antiseptic. Buck's extension should be put on these cases to prevent destruction of ends of bones in the joints due to contraction of muscles and ligaments. Pressure destroys the synovial membrane then the cartilage. Every physician should be as careful about the treatment of his joint cases to prevent ankylosis as he is about his fracture cases to prevent deformity or non-union.

Dr. Murphy touched briefly upon the treatment of fractures. He thought that there were more cases of ununited fractures since the introduction of more perfect mobilization. With a fracture near a joint one desired perfect immobilization to secure smallest amount of callus and perfect coaptation of parts.

In inserting a transplant to unite a fracture one needed perfect mobilization so callus would not form between transplant and boney tissue to prevent osteogenesis. Too, one should elevate the periosteum back from the fractured ends and bone chips put between periosteum and bone to stimulate osteogenesis and prevent growth of periosteum between ends of bone that the transplant unites.

**KENT COUNTY**

The Kent County Medical Society resumed its meetings on October 13 after a summer vacation which, this year, included the State Meeting in Grand Rapids. Dr. J. G. Huizinga read an interesting and instructive paper on "Business Methods in the Medical Profession," and Dr. Richard R. Smith then gave a thirty minute talk on "Tumors of the Face and Neck," illustrated with a large number of fine, original lantern pictures of the various tumors described.

At the meeting of October 27, Dr. L. E. Sevey and Dr. A. H. Edwards were elected to membership. Dr. V. M. Moore reported excellently a case of multiple exostoses in a girl of 23. The guest of the evening was Dr. Charles B. Reed of Chicago who spoke on "The Induction of Normal Labor at Term." Although a number of objections might occur to the average physician with regard to any method of handling "confinements by appointment," Dr. Reed's paper was so carefully worked out and the possible adverse criticisms so well answered beforehand that the discussants were unable to bring their 42 centimeter guns into action to any appreciable extent.

On December 6, Dr. Wm. J. Mayo will be the guest of our Society at Grand Rapids. His subject will be "The Physiology and Pathology of the Large Intestine." This will be given at 8 o'clock. At 6 o'clock the Society will give a large subscription dinner to Dr. Mayo in the Hotel Pantlind ball room to which all physicians of Western Michigan are invited. The Society has decided to share half the expense of this dinner to the visiting doctors, and will make a charge of only one dollar a plate. Reservations should be made early and should be sent to the Metz Building, Grand Rapids to Frank C. Kinsey.

FRANK C. KINSEY, Secretary.

**SOUTHWESTERN MICHIGAN TRIOLOGICAL ASSOCIATION**

The regular meeting of the Southwestern Michigan Triological Association was held in Battle Creek Monday evening, October 18. There were present from out of the city Drs. Bulson, of Jackson; Welsh, Rogers and Roller, of Grand Rapids, and Wilbur, Bernstein, Grant, and Mr. Perkins of Kalamazoo.

Minutes of the two preceding meetings were read and approved.

The Secretary presented his report for the past year showing a membership of thirty-one and a balance in the treasury of \$9.03. The report was accepted and adopted.

Upon nomination of Dr. Bulson, Dr. Bernstein was re-elected President, and upon nomination of Dr. Wilbur, Dr. Haughey was re-elected Secretary.

Dr. Sleight presented several cases showing var-

ious conditions of the eye: Interstitial keratitis, opacities, abnormal conditions of the disc, etc. Dr. Haughey presented a case of black or hairy tongue. This is a very uncommon condition pathologically consisting of a hyperkeratosis, with an enormous increase in length of the papillae. The patch is extensive, and the "hairs quite fine, and all growing forward."

Dr. Haughey read a paper on some of the Phenomena and Treatment of Hay Fever. An active discussion followed, participated in by the members and by Mr. Perkins, a bacteriologist of Kalamazoo who has had considerable experience in working with pollen products.

The meeting adjourned to meet during November in Grand Rapids.

WILFRID HAUGHEY, Secretary.

**WAYNE COUNTY**

Program October 25, 1915.—Surgical Meeting.

Fractures of Spine and Pelvis (Illustrated),  
Dr. Wm. A. Evans.

Fractures of the Skull (Illustrated),  
Dr. Wm. J. Cassidy.

Discussion by Drs. Preston M. Hickey, G. C. Chene, J. E. King, Rollin H. Stevens, Chas. F. Kuhn.

Program November 1, 1915—General Meeting.

Marriage Rites and Obstetric Practices Among the Ancient Romans (Illustrated),  
Dr. W. P. Manton.

**NEWS ITEMS.**

Physician's Business Bureau, John N. Bell, Manager, Cherry 3489.

Why is it that the Physician's Business Bureau is not a part of the Wayne County Medical Society? If there is a question in the minds of some of the medical profession that the Physician's Business Bureau is not popular they should have attended last Monday evening's meeting. We believe that scientific business methods are essential in the present day practice of medicine. If that be the case why is it that the Physician's Business Bureau is not a part of the Wayne County Medical Society? At present the President of the Wayne County Medical Society appoints four of the six members of the Board of Control, but such appointment must be approved by the East and West Side organizations. Though the books are subject to inspection, yet they are not under the control of the officers of the Wayne County Medical Society who handle the finances. It is being demonstrated that the Bureau is self-supporting. The society is incorporated and would give considerable prestige to such an organization as the Bureau. It is understood that there would be no objection to such a transfer on the

part of those who were instrumental in starting it. Is it not worth our consideration?

Program November 8, 1915.—Medical Section.

The Encroachment of Chronic Organic Diseases in this Country,

Dr. Eugene Lyman Fiske.

Director of Hygiene, Life Extension Institute, New York City.

Discussion by Drs. Wm. M. Donald, Guy L. Kiefer, R. A. C. Wollenberg, E. W. Haass.

Program November 15, 1915.—General Meeting.

Medico-Legal Night,

Dr. F. B. Tibbals.

Mr. H. Barbour, Attorney at Law.

Discussion by Drs. W. J. Stapleton, J. N. Bell, J. E. Davis.

We are pleased to introduce our new Librarian, Miss Ethel L. Goff, who took charge the first of the month. She will be assisted by a House Secretary, Miss Sara Spotteswood. We are sure they will receive a cordial welcome from all the members of the Society.

Program November 22, 1915.—Surgical Section.

Some Observations on the Surgery of the Bile Passages and Liver.

Dr. C. A. Hamann, Cleveland, Ohio.

Discussion opened by Dr. Angus McLean.

#### THE TOLEDO TRIP.

On Friday evening, November 5, the Society accepted the invitation of the Toledo Academy of Medicine and made the trip to Toledo in a special car over the D. U. R. About twenty-five members attended, all of whom report a most enjoyable evening. The car left Detroit at 6:00 p. m., and returned, leaving Toledo at midnight, Detroit time. They had supper at the Toledo Commercial Club, after which a joint meeting was held.

Papers were read by Drs. Wilson and Hirschman, and a paper by Dr. Griswold was read in his absence by Mr. Clinton Chilson.

Dr. Levinson, of Toledo, showed a case of Hodgkin's disease, and Dr. Morgan presented a case of persistent foramen ovale in a baby of ten weeks. The Wayne County Medical Society is looking forward with pleasure to the visit which we hope the Toledo Academy will pay us in the not distant future.

The following members attended the meeting: Drs. G. C. Bassett, J. N. Bell, A. P. Biddle, Chas. Barton, Harry Black, J. H. Carstens, H. R. Carstens, C. L. Candler, G. C. Chene, T. B. Cooley, Clinton Chilton, L. C. Donnelly, P. M. Hickey, L. J. Hirschman, C. B. Lockwood, A. L. Loucks, G. H. McFall,

R. H. Stevens, F. B. Walker and Walter Wilson, of Detroit, and J. E. Maunders and N. T. Langlois, of Wyandotte, and W. F. Ackers and C. T. Southworth, of Monroe.

#### NEWS ITEMS.

Physicians' Business Bureau, John N. Bell, Manager, Cherry 3489.

We hope you received your check the first of the month. Perhaps you have no accounts with the Bureau or perhaps you have not called and gone over those the Bureau has at the present time. There are those who still forget that time waits for no one, and forget to make a report when some debtor calls and makes a payment. The Bureau gets more out of it by collecting through the first form letter than when the account goes to the collector.

The Bureau is making a collection of case records and accounting systems. We ask every doctor having a system that is satisfactory to them to mail us a card of each. If we find your form meets with the approval with many, or that we can use it in drafting a new card, we will appreciate it very much. We intend keeping a stock on hand of the most popular forms.

We heard of one member who left his account with the Bureau long enough for the assistants to work up his claim to the point of payment then asked for the account back. What would you think of such a man?

The Board of Control is contemplating purchasing a metal filing cabinet. Do you know of any bargains? Points to remember! This Bureau is your Bureau, and your Bureau will be what you make it. We have welcomed all past suggestions and criticisms; have you made any suggestions or criticisms?

R. L. CLARK.

Program November 22, 1915—General Meeting.  
Syphilis of the Nervous System—A Review,

Dr. Chas. W. Hitchcock.

Discussion by Drs. A. W. Ives, Wesley Taylor, H. R. Varney.

The Salvarsan Committee submitted its report at the last meeting. After considerable correspondence with the Department of State at Washington, which exchanged cables on this subject with London, a beginning was made. While all was not accomplished which we desire, the English government has already permitted the release of a small quantity of Neosalvarsan. About 2,500 doses were accordingly shipped to New York and are being distributed to those who put in orders for this remedy. Such a small amount is manifestly inadequate to supply even a small percentage of the immediate

demand. A few of our local physicians were fortunate enough to get a tube apiece and in one case several tubes. However small and inconsequential this may seem at first glance, it is nevertheless a triumph and may be considered to indicate the adoption of a more liberal policy on the part of the British administration. Our Salvarsan Committee is to be congratulated on its success and commended for its able and earnest efforts.

The librarian has been calling ovedue books. In view of the fact that the library is to be re-catalogued it is more important than ever that books be returned promptly.

The library is indebted to the kindness of Dr. Geo. Duffield, who has presented the following books to the library:

Babcock, Robert H.—Diseases of the Heart and Arterial System.  
 Cabot, Richard C.—Physical Diagnosis.  
 Conn, H. W.—Agricultural Bacteriology.  
 Cowing, W. H.—Blood Pressure.  
 Croftan, Alfred C.—Clinical Therapeutics.  
 Diday, P.—Treatise on Syphilis.  
 Faught, Francis Ashley—Blood Pressure.  
 Hare, Hobart—A Text-Book of the Practice of Medicine.  
 International Clinics, vol. 3 (1906).  
 International Medical Annual, 1911.  
 Keating, John M.—How to Examine for Life Insurance.  
 Noorden, Carl von—Clinical Lectures on the Pathology and Therapy of Disorders of Metabolism and Nutrition, 1907-1910.  
 Osler, Wm.—Practice of Medicine.  
 Savill, Thomas D.—Clinical Lectures on Neurasthenia.  
 Schmidt, Adolf.—The Test-Diet.  
 Slade, Chas. B.—Physical Examination and Diagnostic Anatomy.  
 Whitla, Wm.—A Dictionary of Treatment; or Therapeutic Index.  
 Wilson, J. C.—A Handbook of Medical Diagnosis.

In the past members of this society who are interested in the library have subscribed to a number of periodicals. We should like to have this custom continued.

Will former subscribers please demonstrate their continued interest in the library by renewing their subscriptions? We also wish to gain as many new subscriptions as possible. We would wish that others give this matter consideration and do their best to help us in fully equipping the library with the best known medical journals.

### TRI-COUNTY

Meeting of Tri-County Medical Society was held in club rooms, November 4, 1915, at which time the following officers were elected.

President—R. J. E. Oden, Cadillac, Mich.

First Vice-Pres.—A. W. Harper, Manton, Mich.

Second Vice-Pres.—R. Broduer, Cadillac, Mich.

Secretary and Treas.—O. L. Ricker, Cadillac, Mich.

Following this election a committee was appointed to confer with health department, relative to diphtheria conditions in Cadillac.

OTTO L. RICKER, Secretary.

### Book Reviews

DISEASES OF THE BRONCHI, LUNGS, AND PLEURA. By Frederick T. Lord, M.D., Visiting Physician Massachusetts General Hospital. Illustrated with 93 engravings and three colored plates. Cloth, 600 pages. Lea & Febiger, Philadelphia.

This is a practical treatise on the respiratory organs presenting current knowledge based on the literature and the author's personal experience.

Thorough in description text, clear in the discussion of each subject, instructive in its entirety, the work is assured to be appreciated by every practitioner and student.

PRINCIPLES AND PRACTICE OF OBSTETRICS. By Joseph B. De Lee, A.M., M.D., Professor of Obstetrics at the Northwestern University Medical School. Second edition, thoroughly revised. Large octavo of 1087 pages, with 938 illustrations, 175 of them in colors. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, \$8.00 net; Half Morocco, \$9.50 net.

The author's name at once commands attention and respect. It is a work that no physician doing obstetrical work can be without—it becomes absolutely essential. This second revision has brought the book up to the date of August, 1915. The first edition filled a distinct want and this new edition more than supplies the want.

THE CLINICS OF JOHN B. MURPHY, M.D., at Mercy Hospital, Chicago. Volume IV., Number V., (October, 1915). Octavo of 228 pages, 56 illustrations. Philadelphia and London: W. B. Saunders Company, 1915. Published Bi-Monthly. Price per year: Paper, \$8.00. Cloth, \$12.00.

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WHAT TO EAT AND WHY. By G. Carroll Smith, M.D., of Boston, Mass. Second edition, thoroughly revised. Octavo of 377 pages. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, \$2.50 net.

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VOLUME XIV—No. 12  
WHOLE NUMBER 160

GRAND RAPIDS, MICH., DECEMBER, 1915

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to overcome the cause; for example, fat constipation is corrected by giving a skimmed milk feeding; deficient sugar constipation, by adding  $\frac{1}{2}$  ounce of cane sugar to the regular formula. In some of the cases of persistent constipation it is often necessary to add milk or magnesium to the feeding, using one teaspoonful to the morning and evening feeding.

**What to do in Vomiting**

Vomiting may be due to many causes, the principal causes being: too frequent feedings; large hole in the nipples, allowing the food to be taken too rapidly; not keeping the baby quiet after nursing; tight belly bands.

The treatment of acute vomiting is immediate stop all food. Vomiting cases even water should not be given.  $\frac{1}{2}$  hour until 1 to 2 grains of grain are given. Calomel at once given,  $\frac{1}{2}$  grain are given. The effect of castor oil is not as good in cases of vomiting as that of calomel, because it is less apt to be retained, and thus its effect is spoiled.

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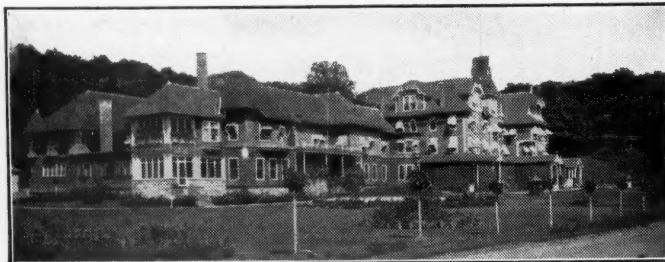
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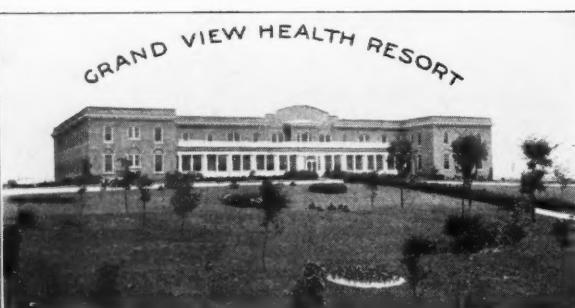
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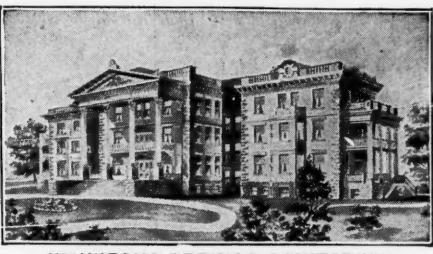
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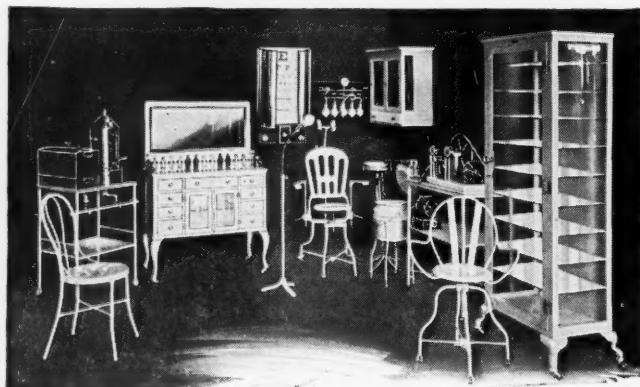
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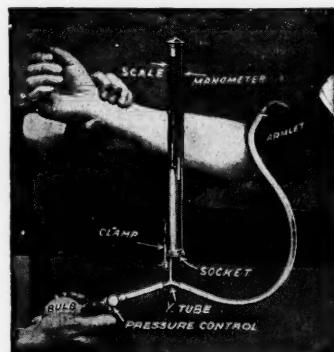
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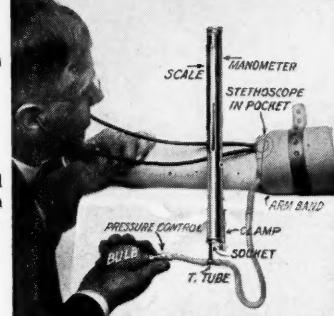
Price  
**\$12.00**



**No. 2**

As shown with Improved Arm-Band, Stethoscope and 80 page cloth bound book on Blood Pressure with leather carrying pouch.

Price  
**\$15.00**



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New Junior Norfolk suits from \$1.50 to \$8.00.

“Knicker” wool suits with two pairs of trousers.

Semi-Norfolks—Plaited Back—\$5.00 to \$15.00.

His "First Long Trousers Suit" in all wool Materials from \$10.00 to \$25.00.

Hosiery that will wear—Tapeless Waists—Shirts—Underwear.

Raincoats for Boys—Little Girls' water proof outfits of Coat, Cap and School Bag that will keep out the wet—\$5.00.

Mail orders given immediate attention. Charges paid on Long Distance Telephone

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Don't Fail to Visit This New Department

Don't Fail to Visit This New Department.

# **Carr-Hutchins-Anderson Co.**

**Clothing, Hats & Furnishings for Father and the Boys**    **GRAND RAPIDS, MICH.**

(Please mention the Journal when buying).

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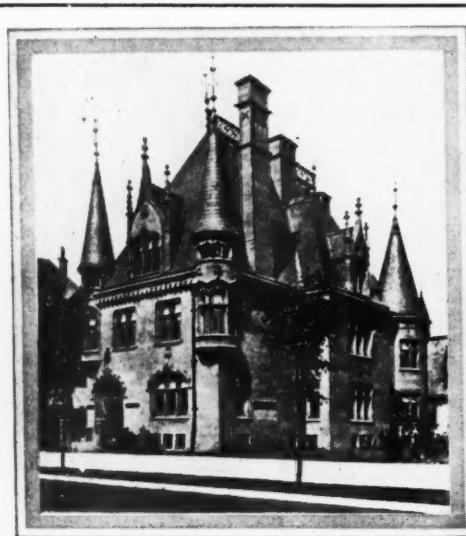
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**Analyses** { Chemical Microscopical } Analyses  
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Exclusively for the Treatment of  
Drug Addiction and Alcoholism

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is maintained exclusively for the treatment of those who have become addicted to the use of drugs, and wish, without suffering or publicity, to be freed from the habit and its craving. The method employed is that described in the Journal of the A. M. A. under date of June 21, 1913. Each patient is given a thorough examination, clinical and laboratory, and treatment modified in accordance with the findings.

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Address \_\_\_\_\_



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# Diphtheria Antitoxin that leaves nothing to be desired.

**I**N the preparation of our Antidiphtheric Serum the element of guesswork never enters. Modern scientific methods mark every step in the process of manufacture.

We maintain a large stock-farm, miles from the smoke and dust of the city, where are kept the animals used in serum production.

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SPECIFY "P. D. & CO." ON ORDERS TO YOUR DRUGGIST.

Home Offices and Laboratories,  
Detroit, Michigan.

**Parke, Davis & Co.**

## Nemo Wonderlift Corsets for all Figures

**SELF-HELP**  
*Nemo*  
**WONDERLIFT**

So far we have produced four different models in Nemo Wonderlift Corsets. From these models, women of every type of figure (not abnormal) may be accurately fitted.

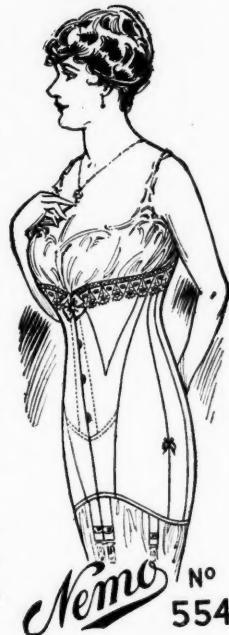
No. 554 (pictured) is designed for short stout women, or those of medium height—\$5.00.

No. 555 is similar, but with longer lines, for taller women of full figure—\$5.00.

No. 556 is designed for women of slender to medium form, or even for *slight* figures, as it is made in sizes from 20 up—\$5.00.

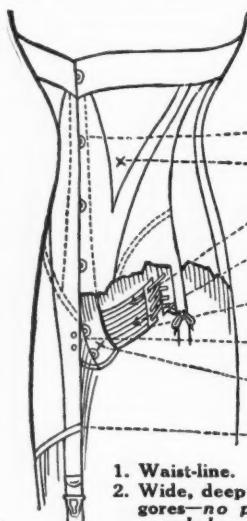
No. 1000 is a corset *de luxe*, for average full figures. Material is a lustrous silk brocade; beautifully finished—\$10.

An unusual fact in this connection is that these wonderful *health* corsets are also superior *style* corsets. They give no exterior hint of the concealed device that insures such excellent visceral support.



### How to Adjust the Nemo Self-Help Wonderlift Bandlet

The corset is first fitted upon the figure, well down, curved Steele's reaching lowest point of abdomen. The *adjustment* of the Nemo Wonderlift Bandlet must be done in this extremely simple manner:—The two protruding laces (on each side) are *pulled evenly* downward—the same pull on one as on the other. To do this, both laces are wound, flat and even, once around the fore-finger, and firmly held by the thumb. The pull must be *directly downward*—not outward or upward. Pull *slowly*. Do not jerk or twist the laces. Tie laces in single knot, finish with single bowknot.



1. Waist-line.
2. Wide, deep bust-gores—no pressure below waist on stomach and liver.
3. Adjustable semi-elastic binder (oblique muscles).
4. Poupart's ligament.
5. Symphysis pubis.
6. Curved Steele's—no pressure over bladder.
7. Garters attached to semi-detached skirt—no undue pressure on abdomen.

### Why This is a Truly Scientific Supporting Corset

The semi-elastic bandlets are in exact apposition to the internal broad ligament, and, in position and action, closely simulate the lifting and supporting functions of the external and internal oblique muscles. The inner side-lacing permits exact individual adjustment, each side being independent of the other, thus providing for inequalities in size and shape of abdomen. The mechanical construction is such that *the entire weight of support is carried upon the hip bones*, thus protecting the kidneys from undue pressure and the spinal column from distortion.

For all forms of ptosis. Invaluable in inoperable floating kidney. A great help in anteversion, retroversion, prolapsus, ante-partum, post-partum, obesity, hernia. The corset acts as a splint to the internal organs and their ligaments, giving them "physiological rest" until they regain their tone. The elasticity of the bandlets produces a passive massage, reducing fat, correcting the circulation, relieving recent adhesions and preventing new ones.

### This New Kind of a Binder "Stays Put!"

It can't shift. It gives *added comfort*. It does not bulk the figure, but *reduces* it. It accomplishes its purpose *without offending the woman's pride of figure*. Your patient will wear this corset gladly. Too often she throws your binder aside the minute your back is turned.

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We shall be glad to furnish further information on request.

*The Nemo Hygienic-Fashion Institute, 120 East 16th St., New York City, U. S. A.*

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Can Have This Complete Outfit**



**Think of your office entirely finished in White Enamel!**

To the first 100 Doctors sending us \$100.00 each, we will sell this outfit. Or we will ship this outfit on the payment of \$10.00, and ten equal payments of \$10.00 each, making \$110.00 on the outfit on the deferred payment plan.

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## One Eye and Ear Spec One Revolving Stool

One Revolving Stool.  
One Waste Pail with automatic lifting lid.

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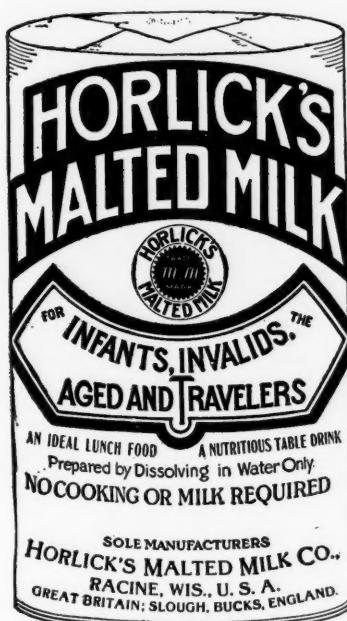
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The *American Journal of Diseases of Children* March 1914, contains an article which states that, after some months of experimental work on different food-products

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gave very satisfactory results, and again proved itself to be a sustaining, complete food, containing in its composition accessory substances (vitamines, etc.) necessary for normal growth and maintenance of constant body weight

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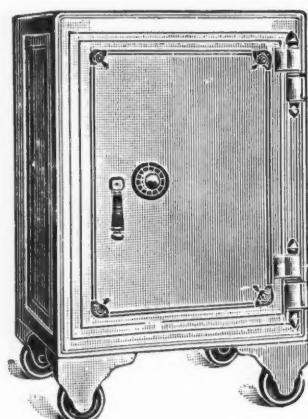
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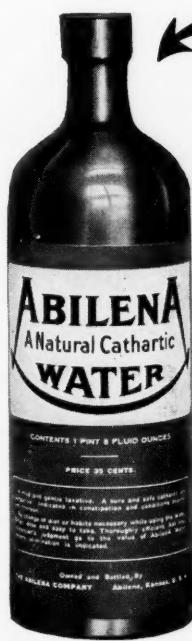
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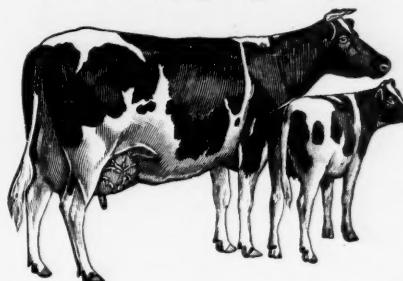
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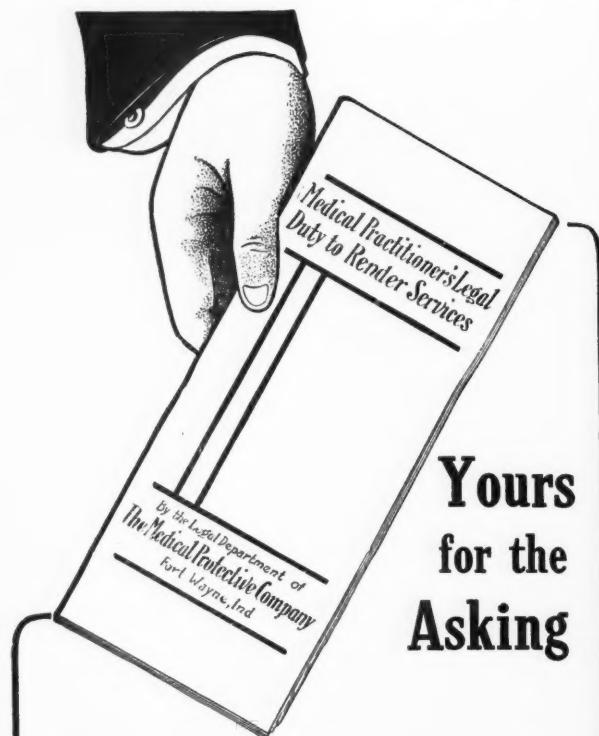
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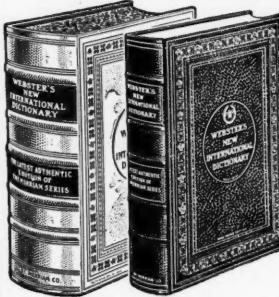
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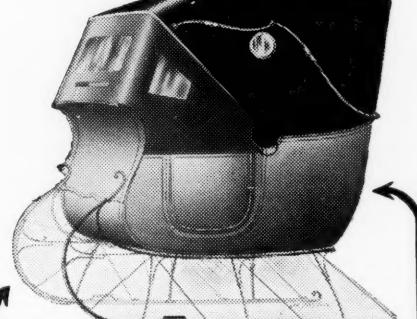
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Emil Ries, Sec'y  
Dept. I, 2400 S. Dearborn St.

The Secretary of the County Society will please Notify the State Secretary immediately of any error or change in these offices.

## COUNTY SOCIETIES

### BRANCHES OF THE MICHIGAN STATE MEDICAL SOCIETY

County	President	Address	Secretaries	Address
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CHEBOYGAN	W. F. REED	Cheboygan	CHAS. B. TWEEDALE	Cheboygan
CHIPPEWA				
LUCE	E. H. WEBSTER	Sault Ste. Marie	R. BENNIE	Sault Ste. Marie
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